OCTOBER 25, 1954

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

METAL SHOW ISSUE

Pattern for Profit . . .

How to get the most out of your production dollar in a competitive economy, p. 133

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It takes Six Bolts –

not just four

to give full bearing protection for greater motor performance

THE TWO EXTRA BOLTS in the end housing of every Allis-Chalmers ball bearing motor are the proof of *extra* protection against bearing failure. These are the bolts that hold the bearing cap tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure . . . protects the grease and the bearing against contamination from dirt and moisture.

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ALLIS-CHALMERS

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But there's a lot behind that phrase, "properly prepared." It means that the bloom is *skinned* – hot-scarfed over its entire surface – before being rolled down to a billet. Next, billets that are ticketed for bars beyond ordinary merchant quality get a thorough going-over by an eagle-eyed inspector like the man shown above, at work in our Lackawanna plant.

He checks billet ends for signs of "pipe"; thoroughly goes over all other surfaces for defects such as scabs, slivers or seams. When he spots an imperfection, he chalk-marks the area for hand-scarfing by the men shown in the background. After scarfing, the inspector carefully re-checks the billet. When that billet gets his final OK, you can be sure its surface condition is right for rolling in the bar mill.

These inspectors and the scarfers who work with them – as well as the Bethlehem people in the raw-materials stockyards, around the furnaces and in the mills – are good, reliable men. They're proud of the excellent equipment they work with, and they're proud of the top-notch products they make . . . quality products like Bethlehem Hot-Rolled Carbon Steel Bars.

If you're in the market for hot-rolled carbon bars, why not see what Bethlehem has to offer? You'll be well pleased! Just write or call the Bethlehem sales office nearest you.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

In this booklet you'll find a discussion of some important decisions which the user must make in selecting the right grade and type to fit his needs. Contains 32 pages, including 6 pages of highly useful engineering data sheets. Write for a copy to Publications Dept., Div. S*, Bethlehem Steel Company, Bethlehem, Pa.

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	FORMER METHOD	TOCCO
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Saving . . . $1.47 per piece

In addition to this saving of $1.47 per piece, TOCCO made possible a switch from alloy steel to S.A.E. 1045 steel, saving $0.110 in material cost per piece.

Total saving on each run of 1375 pieces for this one part is $2,172.50.

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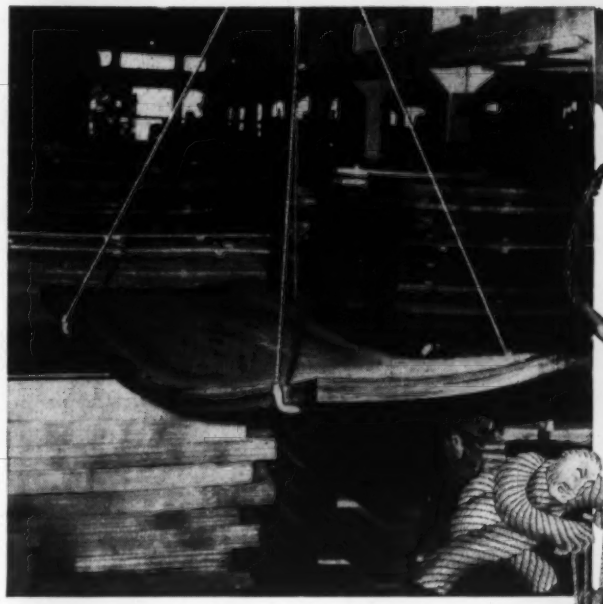

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This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 135 No. 17 October 25, 1954

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the head that's ahead in every way . . .

This new "Serv-Rite" thermocouple head is actually small enough to be held comfortably in the palm of your hand. But size is only one of the many features that make this thermocouple head really extraordinary. It is loaded with installation and service conveniences that any user of thermocouples will appreciate at once.

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Install a "Serv-Rite" thermocouple head and see for yourself how much better it really is.

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behind the scenes

Progress in Metals

The American Society for Metals will present its 36th Annual Metal Congress and Exposition in Chicago Monday, November 1 through Friday, November 5. Technical sessions will be held by the ASM and three participating groups: The American Welding Society, the American Institute of Mining and Metallurgical Engineers, and the Society for Non-Destructive Testing. Say, what a wing-ding *that* will be! Specific gravity of the vocabulary utilized will doubtless approach that of plutonium, and if any layman busts into a session he'll waste his time without an interpreter.

Before commenting on and calling attention to STEEL's October 25 Metal Show Issue, with its special report on production processes, written by the editors specifically for management, we felt a little research on metals would lend an air of authority to our comment. Right away we learned that back in 1904 the Americana commissioned Samuel Sanford, associate editor of *Engineering & Mining Journal,* to do an article on the subject. Sam was understandably brief, because you would be surprised at how much they didn't know about metals half a century ago. He came right out and said it was difficult to define metal; moreover, some non-metals were really metals, and all together in A.D. 1904 there were 45 elements usually classified as metals, and that's all folks: glad we could get together.

Today the picture is much clearer. True, metallurgists, physicists and chemists still argue classifications, and they can't agree whether there are 53 or 73 metals, but in any event they are away ahead of Sam with his 45. Beyond this, every time the boys play around with nuclear fission, brand new metals appear and disappear, literally in a flash.

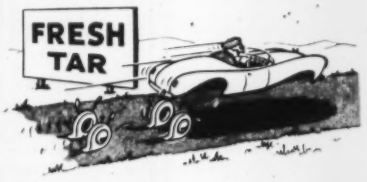
Metal Show Issue . . . A Must

The importance of the Metal Show can't be over emphasized—nor can the Metal Show Issue of STEEL. The theme of the feature article is "Pattern for Profit", and it reveals how you can get the most out of your production dollar in a competitive economy. Much of the information the editors have compiled is just like so much money in the bank. For instance, there are chapters on finishing, testing, forming, heat-treating, joining, handling, casting and machining. Here are some notes: up to ⅓ of the average plant's total activity is accounted for by surface treatment——scientific quality checks sure way to lower production costs ——most metalforming operations can be improved——more heat-treating in '54——much improvement in welding——products undreamed of a few years ago can be cast today—— odds are 9 to 1 you can save money be re-examining your machining jobs.

We have arranged for a limited number of reprints of "Pattern for Profit"; they will be distributed on a first-come, first-serve basis.

Mystery Print

Al Howland, STEEL staff artist, last week was tempted to write Detroit Editor Floyd Lawrence, concerning an auto assembly problem versus fresh tar. Fortunately Al was carrying his black and white line camera at the time he became aware of the phenomenon, so he was able to photograph the action. He didn't send a print to Lawrence because he couldn't explain it. We can't explain it, either; we can't even think of a caption. Can you?



Wanted: English Translator

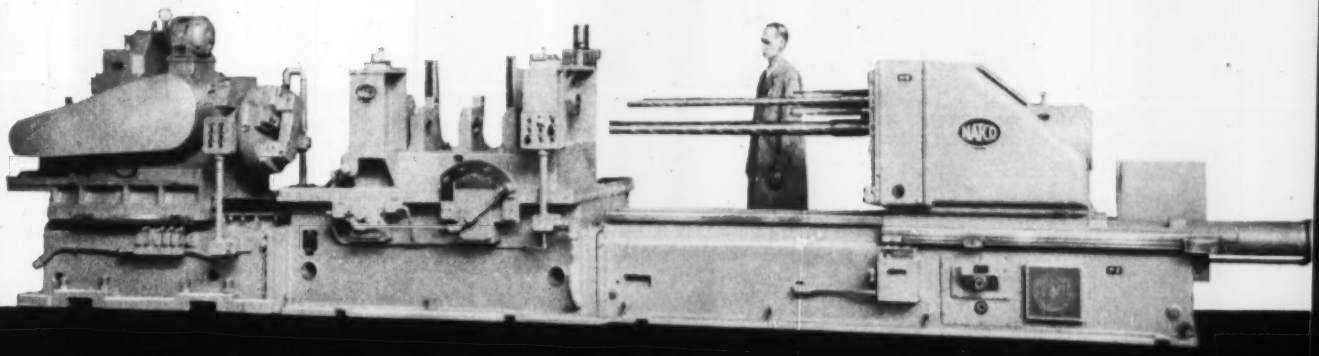
Our ears flapped the other day when we heard this definition of a reporter: one who delves in and exhumes, contrary to the direction of gravity, portions of terrestial alluvium. Naturally, we asked for a translation. It was, "One who digs up the dirt."

Shrdlu

(Metalworking Outlook—Page 83)

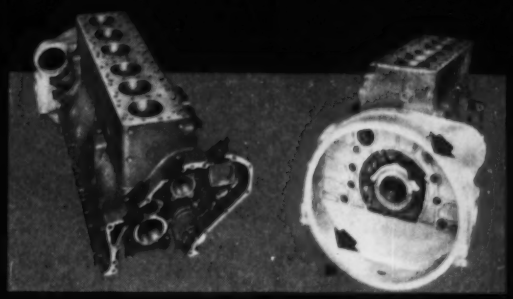
NEW NATCO BOREFACE

SPEEDY, PRECISION PRODUCTION CUTS DIESEL ENGINE BLOCK COSTS



CAM and CRANK FINISH BORING and FACING OPERATIONS DONE SIMULTANEOUSLY ON 4.3 PARTS PER HOUR AT 85% EFFICIENCY!

New NATCO BOREFACE machine, employing two heads, speeds production of diesel engine blocks by finish boring cam and crank holes and boring and cross-feed facing flywheel case simultaneously. The locations and diameters of the straight alignment bores are held to extremely close tolerances. The finished facing on the flywheel housing and cover is held square with the crankshaft bore to within .0025" total indicator reading. These tolerances are made possible by the built-in accuracy of the NATCO BOREFACE and because all operations are performed with one locating of the part.



RIGHT HAND HEAD OPERATIONS
Finish bore 7 (in-line) main bearings
Finish bore oil retainer and cover
Finish bore 4 (in-line) camshaft bearing inserts
Finish bore 2 holes

LEFT HAND HEAD OPERATIONS
Rough, semi-finish and finish bore and rough, semi-finish and finish cross-feed face flywheel housing and cover.

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That's what Reed-Prentice Corporation,* the world's largest manufacturer of injection molding machines for the plastics industry, says about the Kardex Record.
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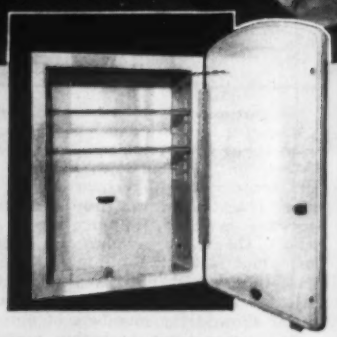
THIS accurate BLANK

saves money

ALL ALONG THE LINE

Photos Courtesy The F. H. Lawson Company



These accurate blanks are held to tolerances of ± .005" on Cincinnati Shears in the shops of The F. H. Lawson Company, manufacturers of medicine cabinets, pails and all sorts of containers.

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LETTERS
TO THE EDITORS

Buys Better Budgets

We have read with interest the article, "Budgeting for Middle Management . . . Make It Pay Off More" (The budget can be a tool for ambitious middle management to prove itself or improve itself . . .) on p. 52 of the Sept. 27 issue. Please send us five tear sheets.

M. L. Cowan
materiel manager
Librascope Inc.
Glendale, Calif.

Please send 20 tear sheets . . . for distribution to local production supervision.

R. F. Cannefax
cost analysis section
Ford Cleveland Foundry Division
Ford Motor Co.
Cleveland

• *Sent.—ED.*

Cause for Comment

Adhesive article, "Adhesives Join the Assembly Line" (July 26, p. 88), is really a wonderful job—beautifully presented—and I'll be very much surprised if it doesn't cause a lot of comment among metal fabricators.

Robert E. McCumber
Minnesota Mining & Mfg. Co.
St. Paul

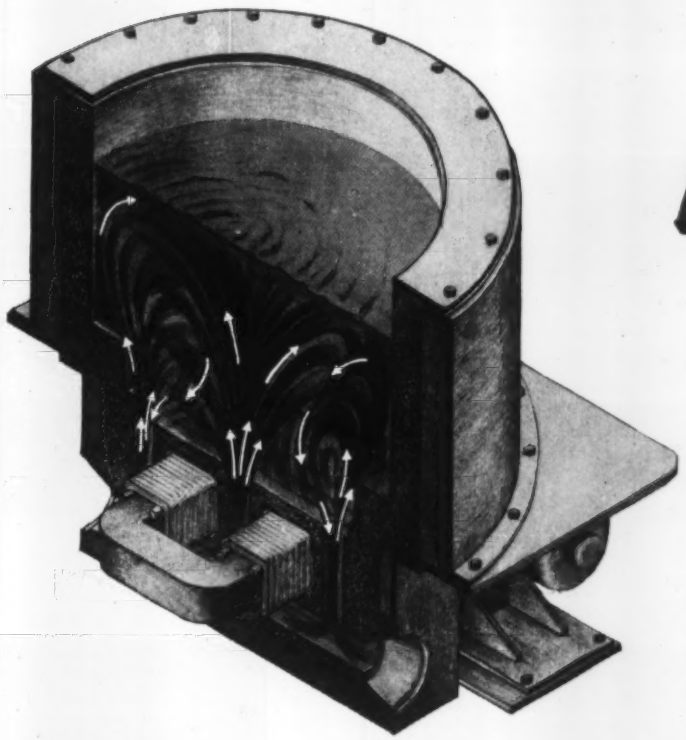
Hot Rodder with a Knock

Permit me to be among the first to be resentful of your article, "Fact, Fiction about Hot Rodders," (in Mirrors of Motordom) in the Sept. 13, 1954 issue of STEEL. Had I known at the time that I was even remotely contributing to this type of flippant report of a sport, the aims, policies and doctrines of which are of the highest order, I certainly would not have allowed the use of a single picture, nor would I have allowed the members of our staff, who were present, including myself, to make statements for publication in your magazine, directly or indirectly . . .

In one phase of your discussion, you state that hot rodders boast that they were solely responsible for the engine development program that started the so-called "horsepower race" among automotive manufacturers. Name one hot rodder who so states. You apply the same line of thought to "enthusiast publications," as you call them. Ours (*Hot Rod Magazine*) is the largest of these publications, and we have *never* claimed that hot rodders have made important contributions to the automotive industry. A few minor ones, yes; contributions that must, of necessity, be overlooked in the interests of quantity production or contributions to the racing

(Please turn to page 12)

The Furnace that Stirs Itself!



ELECTROMAGNETIC PRESSURE CIRCULATES MOLTEN METAL

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AJAX TAMA-WYATT *Induction Furnace*

Heat is generated only in the melting channels. Controlled stirring *(neither too much nor too little)* guarantees uniformity of metal temperature and alloy composition and also leads to efficient melting of light scrap. Tiresome puddling is eliminated. The metal is held entirely in an inert refractory lining. The atmosphere is cool and free from contaminating gases.

No Other Method Enables such Completly CONTROLLED MELTING

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TWIN COIL INDUCTORS

Lead Non-Ferrous Melting

The sectional view above shows the twin coil stirring action of the 100 kW Ajax-Tama Wyatt 60 cycle induction furnace. Heat induced in the secondary channels below is conveyed throughout the melt by electromagnetic circulation as shown by the arrows. The 100 kW furnace shown here, which will be on display at the 1954 Metal Show, is one of a family of twin coil furnaces available today for melting rates from 300 to 10,000 lbs. per hour.

We cordially invite you to inspect the 100 kW AJAX furnace exhibited at the NATIONAL METAL SHOW, Chicago, Nov. 1-5, 1954, Booth #752.

AJAX TAMA-WYATT

AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

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The E. W. FERRY SCREW PRODUCTS Inc.
Smith Road, Brookpark, Cleveland 30, Ohio

LETTERS

(Concluded from page 10)

equipment field . . . If you had to answer a few of the 2500 intelligently written letters that come into my office alone in a month's time, you would be convinced that the number of idiots and braggarts in the hot rod ranks is much lower than the national average.

As far as Detroit and the hot rodders are concerned, we are both victims of the same device—the internal combustion engine. In any design of this type there are definite, established procedures for the extraction of more power and greater efficiency, and the hot rodder is as much aware of these procedures as the Detroit engineer, and he pursues them with equal zest, though perhaps a little less scientifically. The only major difference is the fact that the Detroit engineer must approach and explore the same possibilities as does the hot rodder, but with eye and mind geared to produce in quantity. This brings any automotive development program, whether initiated by Detroit or the hot rodders, quite a bit closer together than "parallel growth;" it puts them on different sides of a one-way street.

Anyone who is fool enough to drive a car with a ragged idle that performs poorly in the city streets has about as much appreciation of what goes on beneath the hood as you, with mechanical ability to match, and any average hot rodder will tell you so. Your own lack of automotive knowledge gave itself away when, in the caption of the lower photo on page 87 . . . you state that the roadster pictured is powered by a Cadillac engine when, in reality, it is a 1954 Buick V-8 engine . . .

Knowing nothing of your background, associations or contacts in the automotive field, it is not at all difficult to peg your attitude as being typical of a self-styled sports car enthusiast. Any bona fide sports car enthusiast or hot rodder is quick to recognize, realize and appreciate what the other fellow is doing and they all speak the same language. On the other hand, the pseudo-enthusiast is affected by the national habits from whence came his particular brand of iron. He speaks freely (but not knowingly) of metres, litres and cubic centimeters, bonnets, mudguards and what-not. However, his mechanical skill and knowledge is somewhat limited to expertly winding the tweed string on a plaid yo-yo . . . Regretfully,

Racer Brown
technical editor
Hot Rod Magazine
Los Angeles, Calif.

Big Demand for Diversification

We are interested in the article, "Product Diversification: Five Roads to Greater Profit," Number 8 in STEEL's 1954 Program for Management. Please send six tear sheets . . .

H. J. Lang
president
National Steel Car Corp. Ltd.
Hamilton, Ont.

Please send 50 reprints . . .

Niels C. Beck
program development engineer
Armour Research Foundation
Chicago

• *Sent.—ED.*

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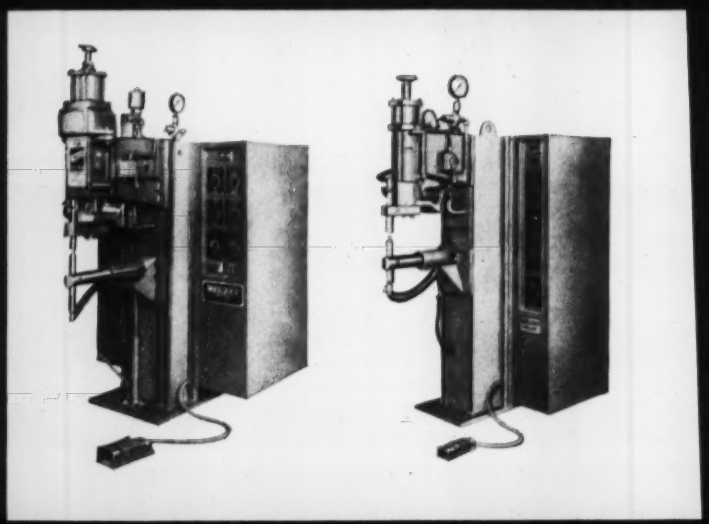

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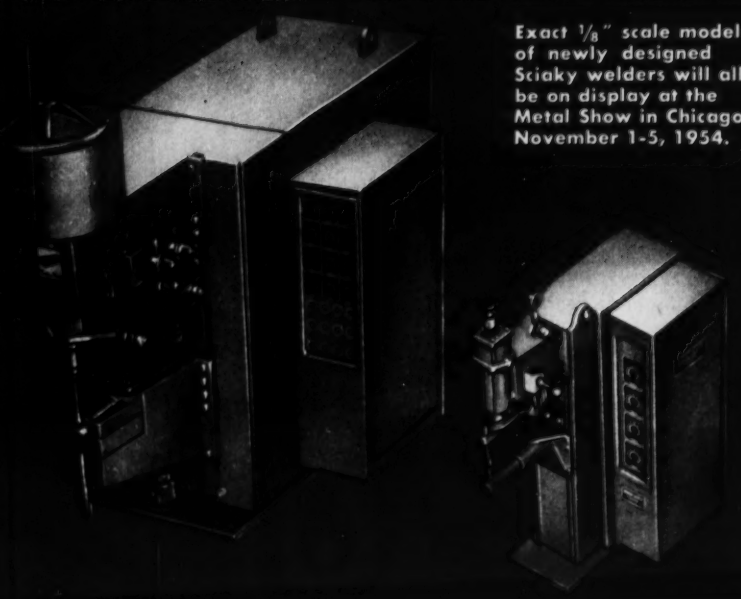


Exact 1/8" scale models of newly designed Sciaky welders will all be on display at the Metal Show in Chicago, November 1-5, 1954.

••• You may find a solution to a fastening problem similar to yours. Be sure you don't miss Sciaky Booth 435 and the typical illustrated applications to resistance welding. Complete details of the applications displayed are contained in free copies of the Sciaky bulletin, "Resistance Welding at Work." If you are not already on the mailing list, ask to be included — it's free, of course!

••• Be sure and examine the much-talked-about, exact 1/8" scale models of the newly designed Sciaky welders at Booth 435. These models have met the most determined challenges of the entire Sciaky Engineering Staff. Besides being interesting to see, the models show many interesting features of the completely new Sciaky design.

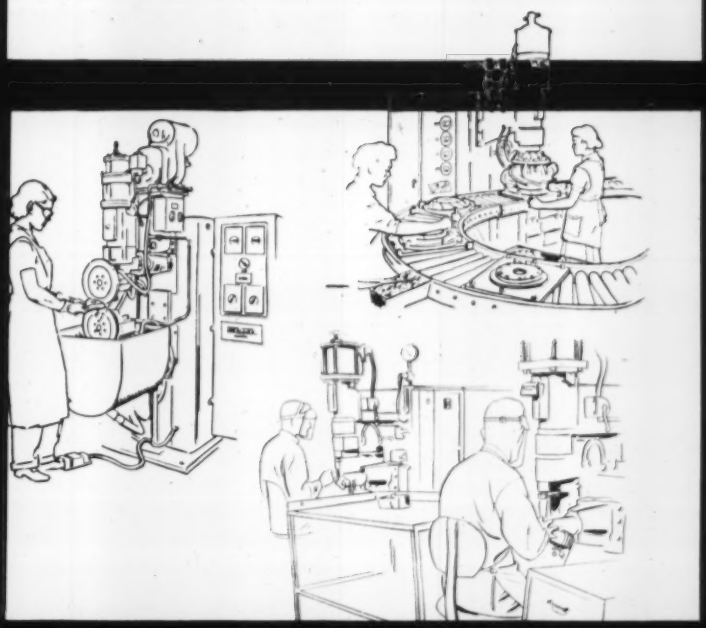
BOOTH

435

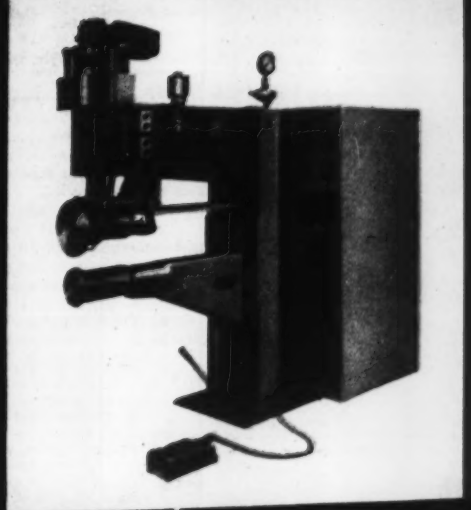
NATIONAL METAL EXPOSITION
November 1-5, 1954
International Amphitheatre
Chicago, Illinois

MACHINES

BOOTH
435



Sciaky's display
for Booth 435 will
contain new Sciaky welders,
illustrated application stories, plenty
of new literature, and those talked-about
scale models — don't miss it!



STOP at Booth 435 at the Metal Show and examine first hand the new concept in resistance welding machines designed by Sciaky.

Experienced Sciaky Application Engineers will answer any questions you may have. Take this excellent opportunity to discuss any fastening applications you may be contemplating.

Visit the Sciaky Plant while in Chicago. Get information and date of the plant "Open House" at Sciaky Booth 435. This is your opportunity to see the unique facilities that produce the entire welder — frame, transformer, pneumatic system, electronic controls, and all!

Remember, stop at the Sciaky Booth 435 at the National Metal Exposition, November 1-5.

SCIAKY

Largest Manufacturers of Electric Resistance Welding Machines in the World

SCIAKY BROS., INC., 4909 W. 67th St., Chicago 38, Ill., Portsmouth 7-5600

THE DIES ARE YOURS FREE!

Yes, we do hundreds of stamping jobs without making special tools—and there's a good reason for this. In stamping out laminated shims for over forty years, we've developed much special equipment and tooling unknown in the average stampings house...including an arsenal of blanking dies and punches... and we've acquired unusual production techniques and skills. This equipment and these special skills are at your service without charge.

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For full information, send for our free 12-page booklet "Service in Stampings." And next time you need stampings, let us bid—and discover the savings we offer.

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New facts for your file on

USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

Perforated basket is easy to clean because it's made of Stainless Steel

● Hamilton Copper and Brass Works, a division of Brighton Copper Works, Inc., Cincinnati, Ohio, offers this perforated Stainless Steel basket with its line of steam-jacketed pressure cookers.

It's another application where Stainless Steel's smooth, dense surface dictates the use of this metal. There are no places for food particles to lodge and adhere even on a perforated basket like this. Consequently, cleanups are fast and easy and absolute sanitation is assured.

The kettle itself can be equipped with a Stainless Steel gate valve or flush-bottom valve, giving protection in another place where cleaning can be a problem. The adjustable leg flanges are Stainless Steel, too.

Now is the time to use the sales appeal of Stainless Steel

The many benefits of Stainless Steel make its use in your product a real "plus" from a sales standpoint. Its lasting good looks alone will often justify its use. And, along with this important advantage, goes exceptional resistance to corrosion and abrasion, ease of cleaning and low maintenance costs.

There's never been a better time to take advantage of the qualities of Stainless Steel. And when you do, be sure that perfected, service-tested USS Stainless Steel is used.

MANUFACTURED FROM USS STAINLESS STEEL UNITED STATES STEEL

Two valves dramatically demonstrate Stainless Steel's corrosion resistance

Both of the end gate valves shown above were in service in one of the pipe stills at a Gulf Coast refinery. The top valve, trimmed with Stainless Steel, is still in excellent condition after two years of service in light crude naphtha containing sulfur compounds.

The bottom valve, made of less durable materials, failed after only a year in the same kind of service.

Stainless Steel's ability to stand up under severe service conditions pays off every time. In many applications, it is far and away the most economical material you can use.

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USS

UNITED STATES STEEL

USS HIGH STRENGTH STEELS
UNITED STATES STEEL
TWENTY YEARS OF PERFORMANCE

New facts for your file on

On self-unloading limestone carrier, USS TRI-TEN E Steel increases strength and reduces weight 18,000 lbs.

Built by Manitowoc Shipbuilding Inc., Manitowoc, Wis., the steamer "*John J. Boland*" is typical of the modern self-unloading cargo vessels now operating on the Great Lakes.

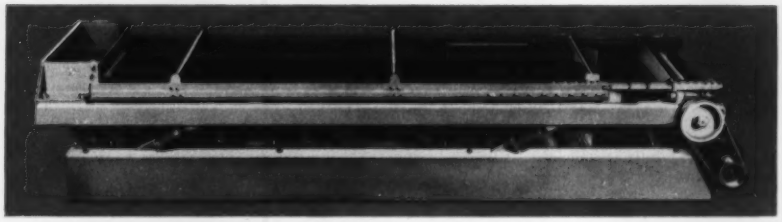
Handling limestone at the rate of 4,500 tons per hour, the 250 ft. boom can be swung through a horizontal arc of 113 degrees on each side of the vessel to discharge cargo, and can be elevated to an angle of 18 degrees. 50,000 lbs. of USS TRI-TEN E Steel were used in the boom and in the huge "A" frame which supports it.

Both these structures were designed by Robins Engineers, Division of Hewitt-Robins Incorporated.

The choice of TRI-TEN E Steel, in plate and structural shape form, was dictated by the fact that the use of this high strength steel not only made it possible to substantially increase the strength and durability of these vital parts, but also resulted in saving between 8 to 10 tons of weight.

For many years, USS High Strength Steels have been successfully employed for special operating equipment such as the unloader shown here, where these "steels that do more" have proved economically superior by keeping weight at a minimum while at the same time insuring maximum strength and durability.

High endurance limit of USS COR-TEN Steel prolongs life of springs for vibrating screens



The high strength and superior atmospheric corrosion resistance of USS COR-TEN Steel are so widely recognized that it is not surprising that design engineers have sometimes overlooked another very important property of COR-TEN Steel, namely its high endurance limit—50% greater than that of carbon steel.

This property which gives USS COR-TEN Steel greater fatigue strength pays off in many applications where repeated loading, reversal of stress, or vibration are involved. For that reason, COR-TEN Steel has been used for several years to improve the performance of support and drive springs for Symons® vibrating screens made by Nordberg Mfg. Co. (illustrated here).

These springs of the laminated type are made of hot rolled strip. They vibrate at 750 to 800 cycles per minute —one million reversals of stress in about 20 hours. By replacing carbon steel with USS COR-TEN Steel, longer and more uniform service life has been obtained.

If you are building or using high speed machinery or other equipment that is subject to severe vibration stresses, it may be to your advantage to find out more about COR-TEN Steel.

UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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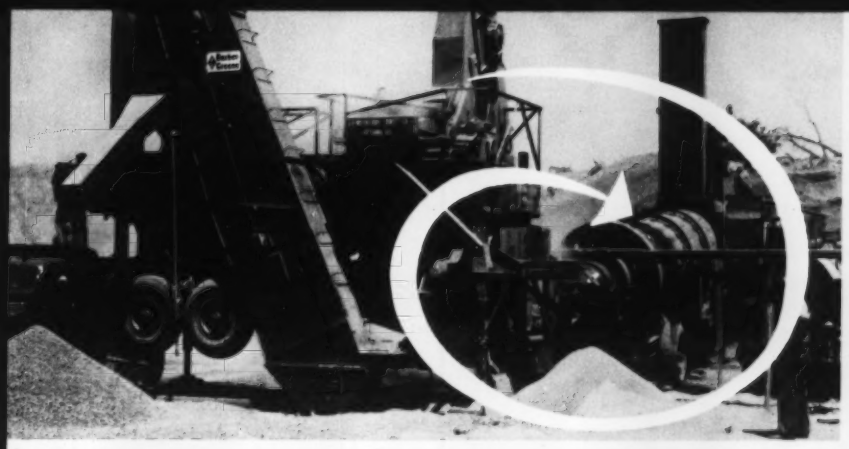
USS HIGH STRENGTH STEELS



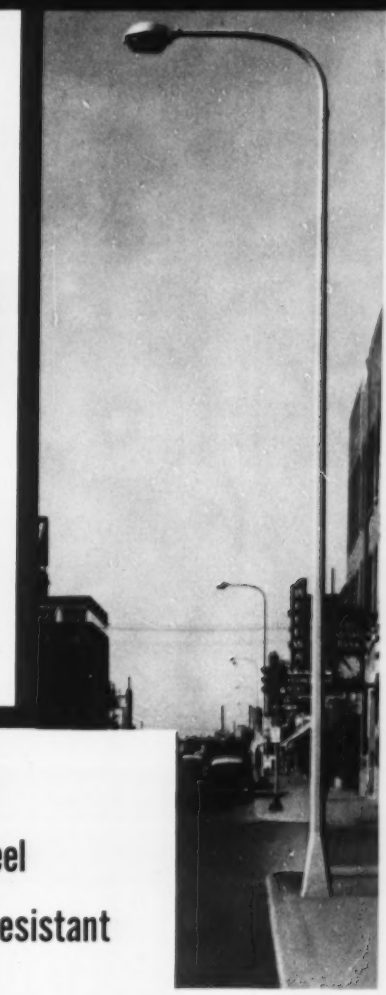
Asphalt plant dryer drum is built of USS MAN-TEN steel to increase resistance to abrasion and heat

Where bituminous roads are being built, Barber-Greene Asphalt Mixing Plants are a familiar sight. The model 845 plant shown here produces tar or asphalt road paving mixes at a rate in excess of 60 tons per hour.

In the dryer, which removes the moisture from the sand and stone used in the aggregate, temperatures run as high as 800°F. and abrasive action is severe. To meet these conditions, the Barber-Greene Co. of Aurora, Ill., builds the entire dryer drum of high strength USS MAN-TEN Steel. With this steel, which has one and a half times greater yield strength than carbon steel, they obtain in addition, greater abrasion resistance and greater resistance to impact and vibration—important qualities that help to prolong life and keep maintenance costs to a minimum.

For more than twenty years USS MAN-TEN Steel has been used to increase the durability of road building equipment of many types. In concrete mixers for example, where ability to withstand abrasion is highly desirable, it has found wide application in the mixing drums, mixing blades, charging hoppers and discharge chutes.

If you want to increase the working capacity of your equipment or give it extra stamina to keep it on the job, all at low cost, find out how readily USS MAN-TEN Steel can be incorporated in your designs, how easily it fabricates and how little it costs to use.



Street lighting standards made of USS MAN-TEN Steel are more rigid . . . more resistant to impact and vibration

In their line of Octa-Tube Lighting Standards, engineers of Millerbernd Manufacturing Company, Winsted, Minnesota, have discovered a low cost way of obtaining maximum strength and durability with minimum weight.

By using 11-gage USS MAN-TEN Steel, with its high strength and its atmospheric corrosion resistance equal to that of copper steel, in place of the usual 11-gage carbon steel, extra strength to resist wind and ice loading conditions was achieved . . . and proven in actual tests.

According to the manufacturer, "Lighting standards take quite a beating in ordinary use . . . impacts from car bumpers and street maintenance equipment, vibrations caused by heavy vehicles, and corrosion from street chemicals or industrial atmospheres. In MAN-TEN Steel, besides extra strength, we get an extra measure of resistance to these impacts, vibrations, and corrosive elements."

Two important factors affecting the choice of USS MAN-TEN were its ability to be cold-roll formed and its readiness to take finish preparations. MAN-TEN qualified highly on both counts.

For more than 15 years, the Millerbernd Manufacturing Company has used USS High Strength Steels in many of its products, resulting in lower costs and improved customer satisfaction. The *extra* qualities of these "steels that do more" are important selling points in this kind of equipment.

USS

UNITED STATES STEEL

Quality Control in the *JET AGE*

BEGINS WITH

DIRECT READING ANALYSIS

- As many as 60 elements analyzed in seconds.
- Drastic reduction in furnace waiting time.
- Laboratory costs cut by two-thirds.
- Productivity greatly increased.
- A higher quality product is ensured.

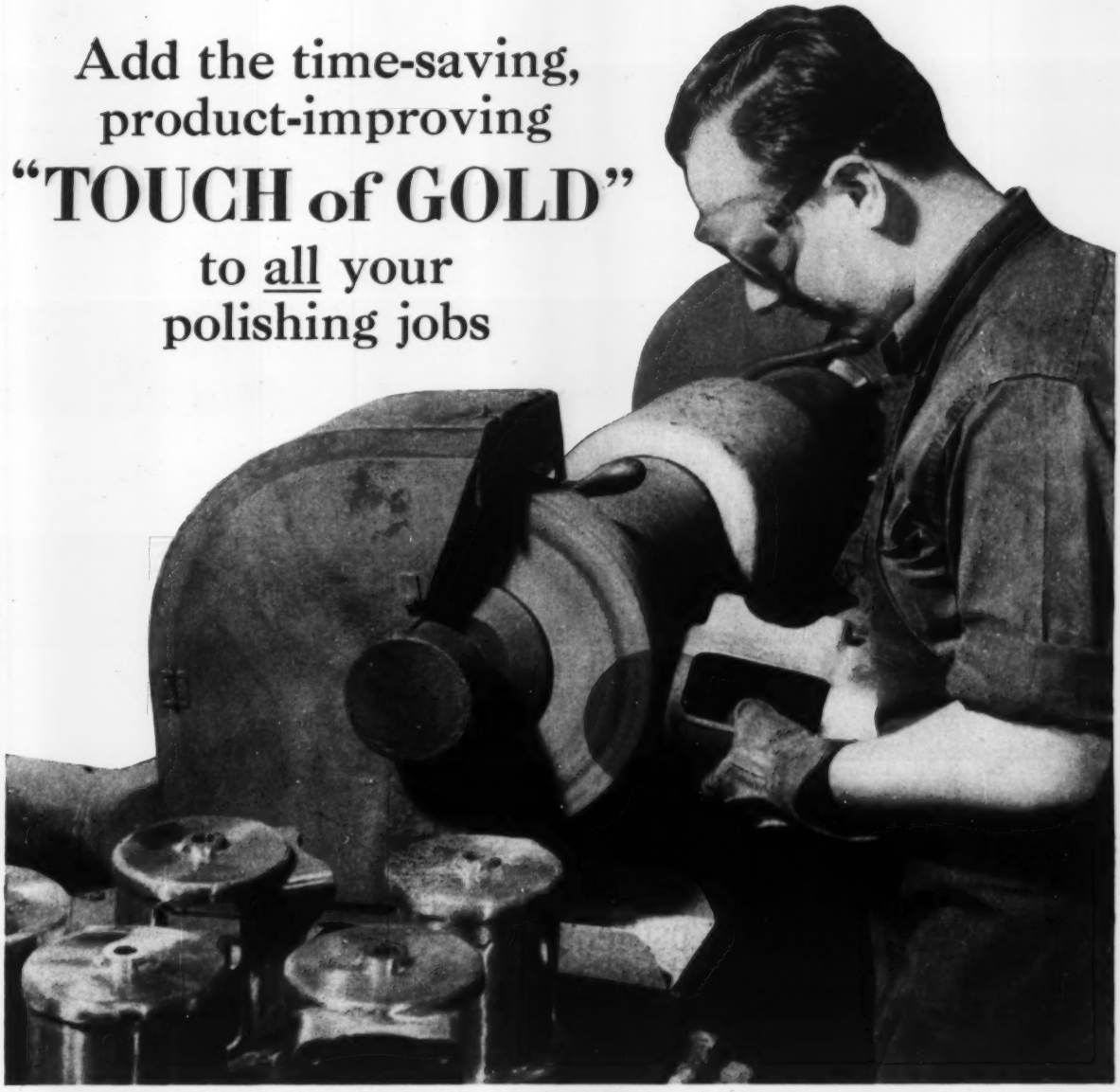
Baird Associates spectrographs and spectrometers are discussed in technical bulletins #32 and #34. Please write for your free copy to Dept. SW.

SEE THE DIRECT READING SPECTROMETER, BOOTH 1348, ASM, Chicago, Nov. 1-6

Baird Associates, Inc.

33 UNIVERSITY ROAD, CAMBRIDGE 38, MASSACHUSETTS, U.S.A.

Add the time-saving, product-improving "TOUCH of GOLD" to all your polishing jobs



Marine Equipment Parts get the value-adding "Touch of Gold" when polished with Norton ALUNDUM* abrasive

When you standardize on Norton ALUNDUM abrasive, every polishing job you do gets off to a better start — and finish!

One reason is because the grains in this Norton-developed abrasive are thoroughly uniform in size, structure and chemical composition. Which means thoroughly uniform polishing, with no oversized grains to mar surfaces, and no flats, slivers or undersized grains to loaf on the job. And you get *fast* polishing, too, because ALUNDUM abrasive is famous for rapid, clean-cutting action.

Another reason is that ALUNDUM is specially processed to give it high capillarity. With *all* grains soaking up cement or glue uniformly and adequately, *each* grain is held firmly — assuring long-lasting, top-performing polishing wheels.

These Advantages In YOUR Polishing

mean better-finished, better-looking products in less time and for less money — the sure "Touch of Gold" you can add to all your set-ups, manual or automatic.

Your Norton Distributor

can supply you promptly with ALUNDUM polishing abrasive in the types, sizes and surface treatments you need. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed in your phone directory yellow pages under "Grinding Wheels." *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass. G-270

NORTON
ABRASIVES

Making better products... to make other products better

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

[Advertisement]

K5H—a performance report on another Kennametal grade with ideas you can use to cut machining costs

Severely interrupted cutting of SAE 4340 forgings with K5H grade, triangular insert in Kennamatic tool.

K5H grade insert tools successfully face aircraft forgings heat treated to 220,000 psi tensile

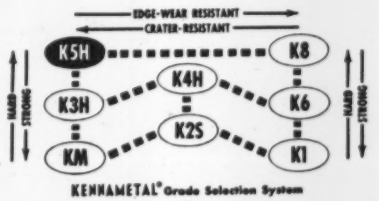
These tough, heat-treated SAE 4340 steel landing gear parts, heat treated to 220,000 psi tensile strength (Rockwell 47C), require severe jump cutting operations.

Using various grades of standard brazed tools, the Menasco Manufacturing Company rough and finish faced both sides at 87 RPM and .0035-inch feed. Even at this relatively low speed and feed, tool life was only two to four pieces per grind. Three cuts were necessary on each side of the forging. Approximately 6.35 minutes were required to change these tools—15 minutes to regrind them.

With K5H inserts in Kennamatic* tools, these forgings are now faced at 150 percent greater speed and twice the previous feed. Only two cuts are required on each face. Rotating the insert to a new cutting edge takes 45 seconds. Since three cutting edges are available on each end of the triangular insert, both sides of 54 pieces are faced before regrinding is necessary. Both ends of the insert are reground in 10 minutes.

K5H is the hardest of the Kennametal* grades. It is highly resistant to cratering, abrasion, galling and pick-up and is available in solid tools and inserts for precision boring and fine finishing of steel at high speeds. K5H is very strong for such a hard material.

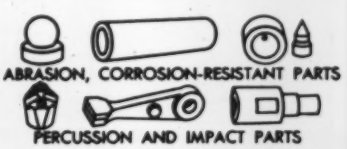
The Kennametal Grade Selection Guide (below) offers you a simplified method for pin-pointing the exact grade of carbide that will assure top tool performance on every machining job. It shows that K5H is the hardest, most crater-resistant of the Kennametal grades. If this grade is being used and cratering is no problem, a change to K8 will provide greater edge-wear resistance. Or, if additional strength is desirable, K3H will improve tool life.



Tool breakage, chipping, excessive edge or top surface wear, heat checks and other causes of poor tool performance indicate a need for tool wear analysis. A Kennametal Tool Engineer is ready to help you with these problems . . . to help you select the best grade and tool for any job. In addition to his own broad experience, he has available to him the backgrounds of 150 other Kennametal Tool Engineers. He's as near as your telephone. Call him, or write to KENNAMETAL INCORPORATED, Latrobe, Pennsylvania.

*Registered Trademark A25

INDUSTRY AND
KENNAMETAL
...Partners in Progress



doubling production...

on this big, accurate job...

Here is another example of the accuracy and productivity of Cincinnati Bickford Super Service Radial Drills. Holes of 4.750" and 6.250" diameters are bored and held to .001" tolerances in this steel casting. Time of operations was reduced from 2 hours and 30 minutes to 1 hour and 40 minutes—practically doubling speed of production.

Write for Booklet R-29.

EUCLID CRANE & HOIST says:

Cincinnati Bickford Super Service Radial "replaced an old machine of different make—machine brought greater ease of handling, less operation fatigue thru convenient controls and easier handling."

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

(Advertisement)

Down This Production Line come some of America's most beautiful fenders. It is one of many places in industry . . .

Where Steel Becomes Curvaceous

To achieve the sleek, graceful lines of today's modern automobiles demands the ultimate in technical skills and quality materials. Take, for example, the process of cold-forming a front fender from cold rolled sheet steel supplied by Pittsburgh Steel Company.

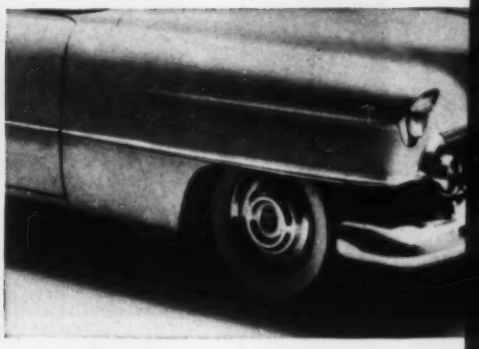
This precise process is possible only when the steel has the proper internal and external qualities that let it flow evenly and true to form

A Fender starts with a flat sheet of cold rolled steel. Each sheet is blanked into a fender-sized panel.

Formed on this 750-ton drawing press, the cold steel panel flows under tremendous pressure to the contour of a fender.

Trimmed to exact size, the fender is scrutinized for any surface defects that may have resulted from the severe drawing.

Welded to the front of the fender is a segment that will hold the headlight. The surface of the weld is then ground off to perfect fender contour.



Quality of the steel and of the fender made from it gives beauty and style where quality counts most.

under tremendous pressure of deep drawing dies. The sheets must be uniform—sheet after sheet.

• **How Is This Possible?**—Good internal quality of the steel, proper chemical analysis, elimination of inclusions in the steel, control of grain structure—prevent stretcher strains from appearing in the surface of the fender. It prevents lamination, seams, rough grainy surface and even tears and breaks in the steel.

The surface of the steel must be free of external defects and its thickness controlled to within a few thousandths of an inch to work properly to the exacting limits of the dies. This assures even flow of the steel to all parts of the dies—prevents wrinkles — prolongs the life of the die.

The steel must have good weldability. As the process continues, the headlight retainer is welded on. Then the dust shield, mounting and reinforcing brackets are installed and it goes to the finishing line.

Metal finishing is the final test of perfection. Here the surface is filed, disc ground and polished. Yet it must retain a finish that is free from swirls, high or low spots, or skin peel.

• **Good Steel Pays**—When you consider these facts, it is easy to understand why automakers who insist on top quality steel buy from Pittsburgh Steel Company.

They know that a four-year, $65-million modernization program has improved facilities in every department and provided steel of sound inherent qualities to be rolled on brand new hot and cold rolled sheet mills. These mills are equipped with the latest technological advances to give the highest scientific accuracy in the control of sheet thickness and shape.

The extra attention to quality at Pittsburgh Steel gives you cold rolled sheet that makes possible higher yield and fewer rejections on your production lines. It makes possible longer die life, less finishing and at the same time improves the quality of your product.

If you want to know more about this new opportunity for savings that result from top quality sheet steel at competitive prices, ask to have a Pittsburgh Steel salesman call. You will enjoy the prompt personal service he will offer.

A copy of the color brochure "The New Pittsburgh Steel Company" is yours for the asking.

"Everything New But The Name"

Pittsburgh Steel Company

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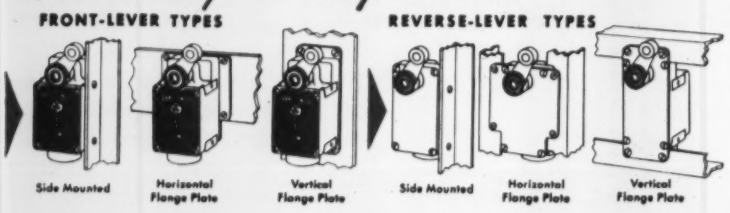
NEW!

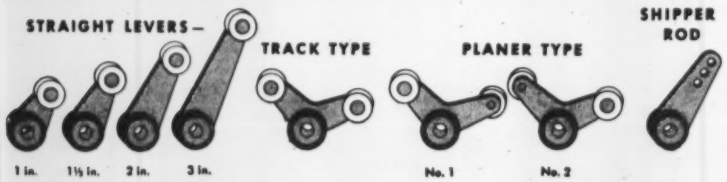
CLARK *Type DM* MACHINE LIMIT SWITCH

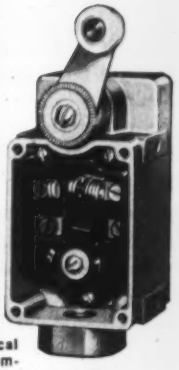
• This new heavy-duty limit switch is built with a minimum of moving parts, and with emphasis on simplicity of construction. The primary objective in its design is to provide dependable, accurate, trouble-free operation for a long life. All latch and trip-bearing surfaces are nylon to steel for minimum wear. All springs are in compression for greatest safety—they cannot be overloaded. This and other features make the switch as nearly fail-safe as possible.

Mounting Arrangements



Operating Levers





Nylon roller cushions impact, has low friction coefficient and long wearing qualities.

Reversible operating lever. Simple screw driver adjustment for reversing or positioning.

Heavy molded insulating chamber surrounds all live parts and provides ample wiring space for four No. 12 wires with Stakon connectors.

Areas subjected to arcing are protected by glass-melamine plates.

Electrical and mechanical sides of switch are completely isolated.

Nema Type 5 dust-tight, oil-tight enclosure of heavy die-cast construction.

Double-concentric overtravel springs in compression for fail-safe operation.

Return spring is in compression. Can be changed without tools to either side of arm, or removed for maintained contact.

Spring-loaded latches are nylon for low friction and long life.

Choice of ½" or ¾" conduit opening.

Write for Bulletin 102DM

The **CLARK CONTROLLER** *Company*

Engineered Electrical Control

1146 East 152nd Street ▪ ▪ Cleveland 10, Ohio

CALENDAR
OF MEETINGS

October 24-27, American Gear Manufacturers Association: Semi-annual meeting, Edgewater Beach hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: J. C. Sears.

October 25-26, Rail Steel Bar Association: Fall meeting, Edgewater Beach hotel, Chicago. Association address: 38 S. Dearborn St., Chicago. Secretary: W. H. Jacobs.

October 25-27, National Lubricating Grease Institute: Annual meeting, Mark Hopkins hotel, San Francisco. Institute address: 4638 J. C. Nichols Parkway, Kansas City, Mo. Executive secretary: Harry F. Bennetts.

October 25-27, Packaging Institute: Annual meeting, Hotel Roosevelt, New York. Institute address: 342 Madison Ave., New York 17. Executive director: Lawrence V. Burton.

October 25-27, American Institute of Electrical Engineers: Machine tool conference, Statler hotel, Detroit. Institute address: 33 W. 39th St., New York 18. Secretary: N. B. Hibshman.

October 25-28, American Institute of Steel Construction Inc.: Annual meeting and exhibit, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 101 Park Ave., New York 17. Secretary: M. Harvey Smedley.

October 26-28, Society of Automotive Engineers Inc.: National diesel engine meeting, Hotel Statler, Cleveland. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

October 26-28, Purchasing Agents' Association of Baltimore Inc.: Annual manufacturers products exhibit, Emerson hotel, Baltimore. Information: F. J. McHugh, chairman, P.O. Box 1837, Baltimore 3.

October 27, American Iron & Steel Institute: Regional closed technical meeting, South Shore Country Club, Chicago. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

October 27-29, American Ceramic Society: Pacific coast regional meeting, Ambassador hotel, Los Angeles. Society address: 2525 N. High St., Columbus 2. General secretary: Charles S. Pearce.

October 27-29, American Society of Body Engineers: Annual technical meeting and exhibit, Rackham Bldg., Detroit 2. Society address: 100 Farnsworth Ave., Detroit 2. Secretary: E. A. Wilkie.

October 27-29, Grinding Wheel Institute and Abrasive Grain Association: Fall meeting, Edgewater Beach hotel, Chicago. Information: Hunter-Thomas Associates, 2130 Keith Bldg., Cleveland 15.

October 27-30, National Association of Aluminum Distributors: Annual meeting, Boca Raton hotel and club, Boca Raton, Fla. Association address: 1900 Arch St., Philadelphia 3. Secretary: R. B. Wall.

October 28-29, American Society of Mechanical Engineers: Fuels-AIME coal conference, William Penn hotel, Pittsburgh. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

October 28-29, American Foundrymen's Society: Annual metals casting conference, Memorial Union Bldg., Purdue University, West Lafayette, Ind. Information: C. T. Marek, Department of General Engineering, Purdue University, West Lafayette, Ind.

October 28-30, National Association of Cost Accountants: Midwestern regional cost conference, Hotel Fort Des Moines, Des Moines, Ia. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

October 28-31, Society of Industrial Designers: Annual meeting, Williamsburg Inn and Lodge, Williamsburg, Va. Society address: 48 E. 49th St., New York 17. Executive secretary: Sally G. Swing.

October 30-November 5, National Metal Congress & Exposition: International Amphitheatre, Chicago. Information: W. H. Eisenman, secretary, American Society for Metals, 7301 Euclid Ave., Cleveland 13.

October 30-November 5, American Society for Metals: Annual meeting, Palmer House, Chicago. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

NICKELOID METALS

more than a metal!

You by-pass 3 out of 5 basic production steps . . . . cut costs 15 to 20 per cent or more when you use the Nickeloid Method of producing plated metal parts and trim. That's because Nickeloid Metals are PRE-plated in durable, uniform finishes of chrome, nickel, copper or brass; require no cleaning, plating or polishing.* And you don't have to pamper these versatile metals to retain their beautiful mirror-like finishes. Stamp, blank, bend or draw . . . they fit right into standard production techniques.

The Nickeloid Method eliminates three costly steps

No cleaning, plating, polishing. Just fabricate and assemble. 2 steps instead of 5! Nickeloid Metals are also available with Mar-Not protective coating, a fabrication and handling aid.

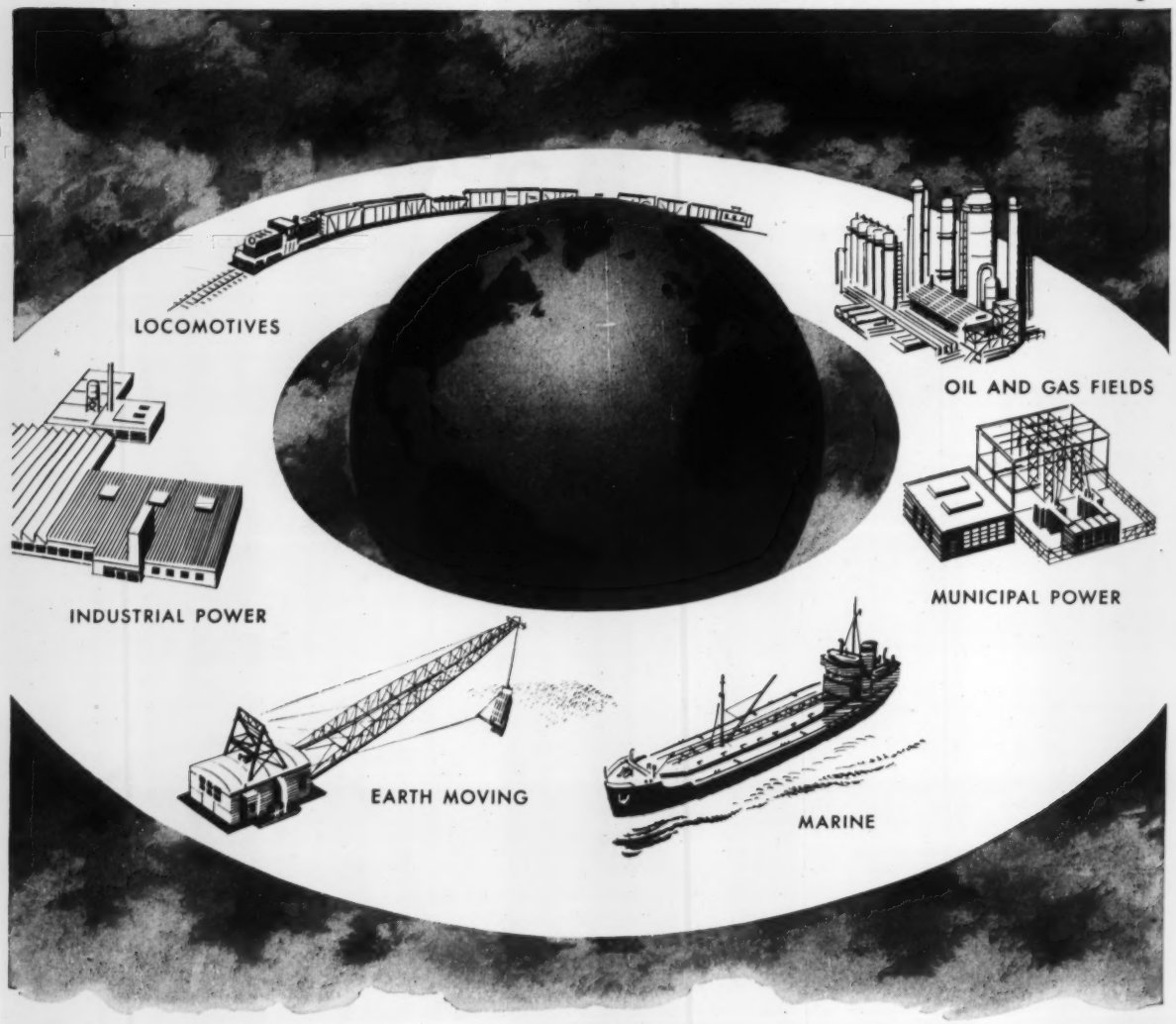
*Pre-plated to base metals of steel, zinc, copper, brass and aluminum. Available in sheets and coils, interesting patterns and finishes.

Free Fabrication and Design Booklet
24 pages of illustrations and reference-type material covering uses, properties and fabrication techniques for Nickeloid Metals. Send today!

NICKELOID METALS
SINCE 1898
NM

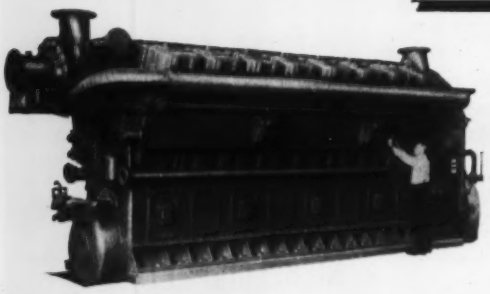
Sales offices in most principal cities

AMERICAN NICKELOID COMPANY, Peru 1, Illinois



The power of COOPER-BESSEMER circles the earth

Mount Vernon, Ohio
Grove City, Pa.



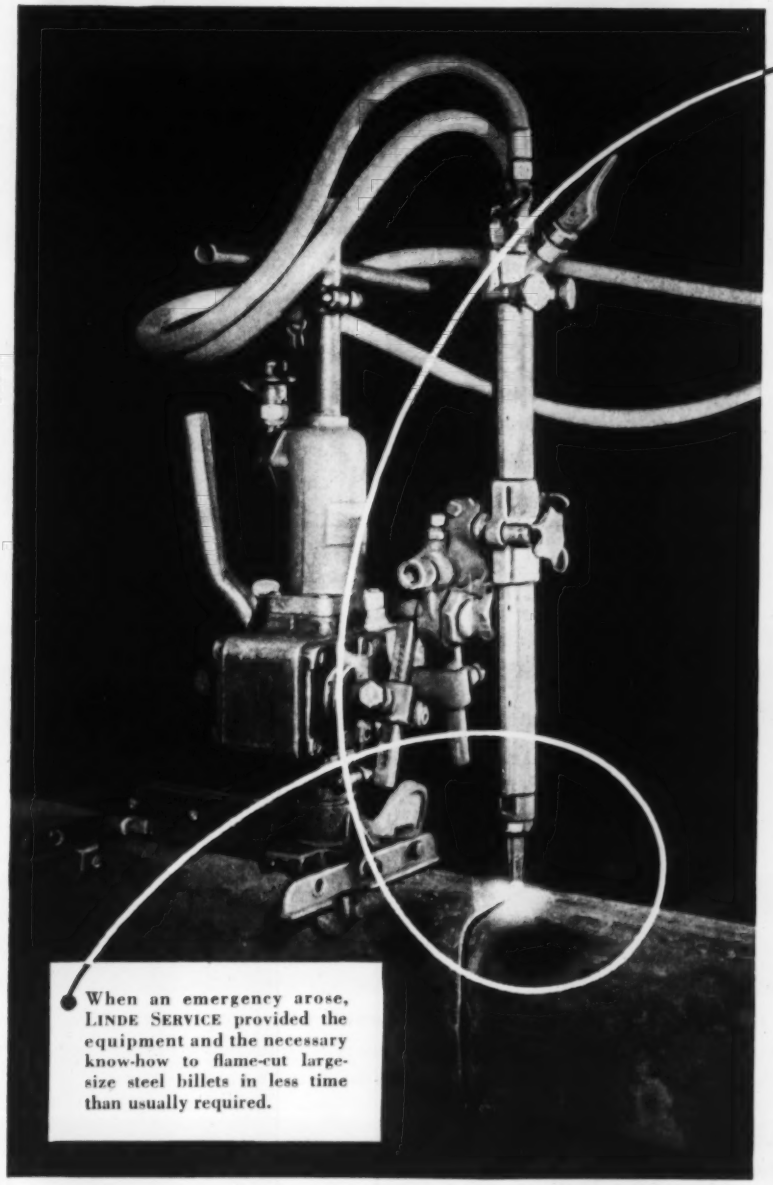
THE use of reliable Cooper-Bessemer power has spread not only to many sections of the world, but also to a wide range of heavy-duty Diesel and gas engine applications.

Recognized for outstanding performance under rugged operating conditions, Cooper-Bessemers offer unsurpassed sturdiness, long service life, minimum maintenance, compactness and low over-all operating expense.

For detailed bulletins and information that will help solve your powering or repowering problems, drop in or write to your nearest Cooper-Bessemer office. Cooper-Bessemer units are available for every power requirement from 200 to 5000 bhp.

New York • Chicago • Washington • San Francisco • Los Angeles • San Diego • Houston • Dallas • Odessa • Pampa • Greggton • Seattle • Tulsa • St. Louis
Gloucester • New Orleans • Shreveport • Cooper-Bessemer of Canada, Ltd., Halifax, N. S.

How LINDE SERVICE*...and Oxygen SOLVED THIS CUTTING PROBLEM



When an emergency arose, LINDE SERVICE provided the equipment and the necessary know-how to flame-cut large-size steel billets in less time than usually required.

When a hot saw broke in a Pennsylvania rolling mill, LINDE SERVICE was called in. LINDE engineers quickly set up four oxy-acetylene bar-cutting machines. Four hundred tons of 7⅝-inch alloy billets, each 40 feet long and each requiring four cuts, were handled at a temperature of 400 degrees. The whole job, including loading and unloading, took only seven hours. And half of the flame-cutting machines were manned by inexperienced operators!

The mill people were well pleased with the results—so much so, that they intend to use the same flame-cutting method every time a job like this comes up.

*LINDE SERVICE

is the unique combination of research, engineering, and more than 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

If your company uses oxygen, LINDE SERVICE can mean dollar savings to you. Let us tell you more about it.

LINDE AIR PRODUCTS COMPANY

A Division of UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street UCC New York 17, N. Y.

Offices in Principal Cities

In Canada: Dominion Oxygen Company

Division of UNION CARBIDE CANADA LIMITED

Linde Trade-Mark

EPOXY RESINS
for metal-forming plastic tools, dies and jigs

EPOXY RESINS
for glass fiber reinforced checking fixtures

POLYESTER RESINS
for reinforced plastic appliance housings

PLASTICS AT THE

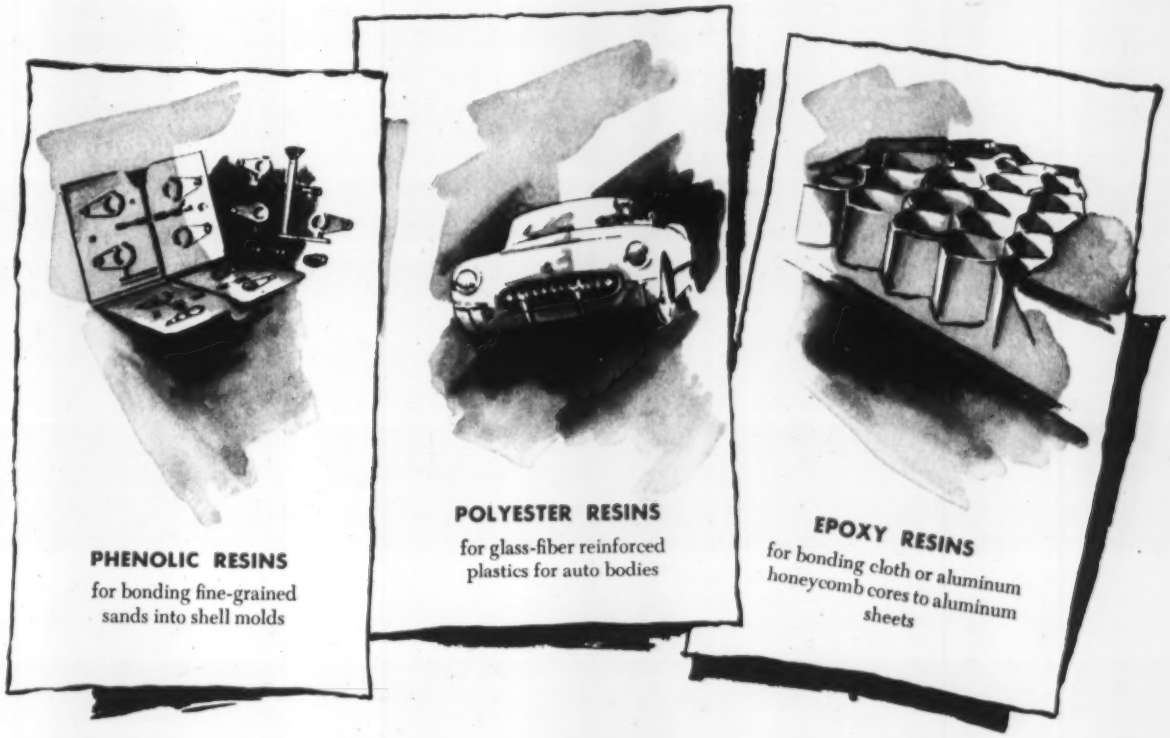
See these features

Make it a point to visit BAKELITE's Exihibit at the Metals Show. Here are a few of the latest developments in plastics which you can examine firsthand:

. . . metal parts produced with epoxy resin tools and dies
. . . foundry castings produced from shell molds bonded with phenolic resins
. . . checking fixture of glass fiber reinforced plastics made with epoxy resins
. . . automobile body sections made from glass fibers and polyester resins
. . . honeycomb cores bonded to aluminum sheets with epoxy resins
. . . fans and other appliance housings of polyester reinforced plastics

These developments are not experimental ideas . . . they are in actual use right now, as a result of the unique properties of BAKELITE Plastics.

Bakelite Company offers the largest variety of plastics and the greatest resources for developing their use to your benefit. Technical representatives will be on hand at the exhibit to help analyze your problems and make useful recommendations. Be certain to visit BAKELITE's Exhibit at the **National Metals Exposition, November 1-5, International Amphitheater, Chicago.**



PHENOLIC RESINS
for bonding fine-grained sands into shell molds

POLYESTER RESINS
for glass-fiber reinforced plastics for auto bodies

EPOXY RESINS
for bonding cloth or aluminum honeycomb cores to aluminum sheets

METALS SHOW

at Bakelite's exhibit

BAKELITE
TRADE-MARK
PLASTICS

TRADE MARK

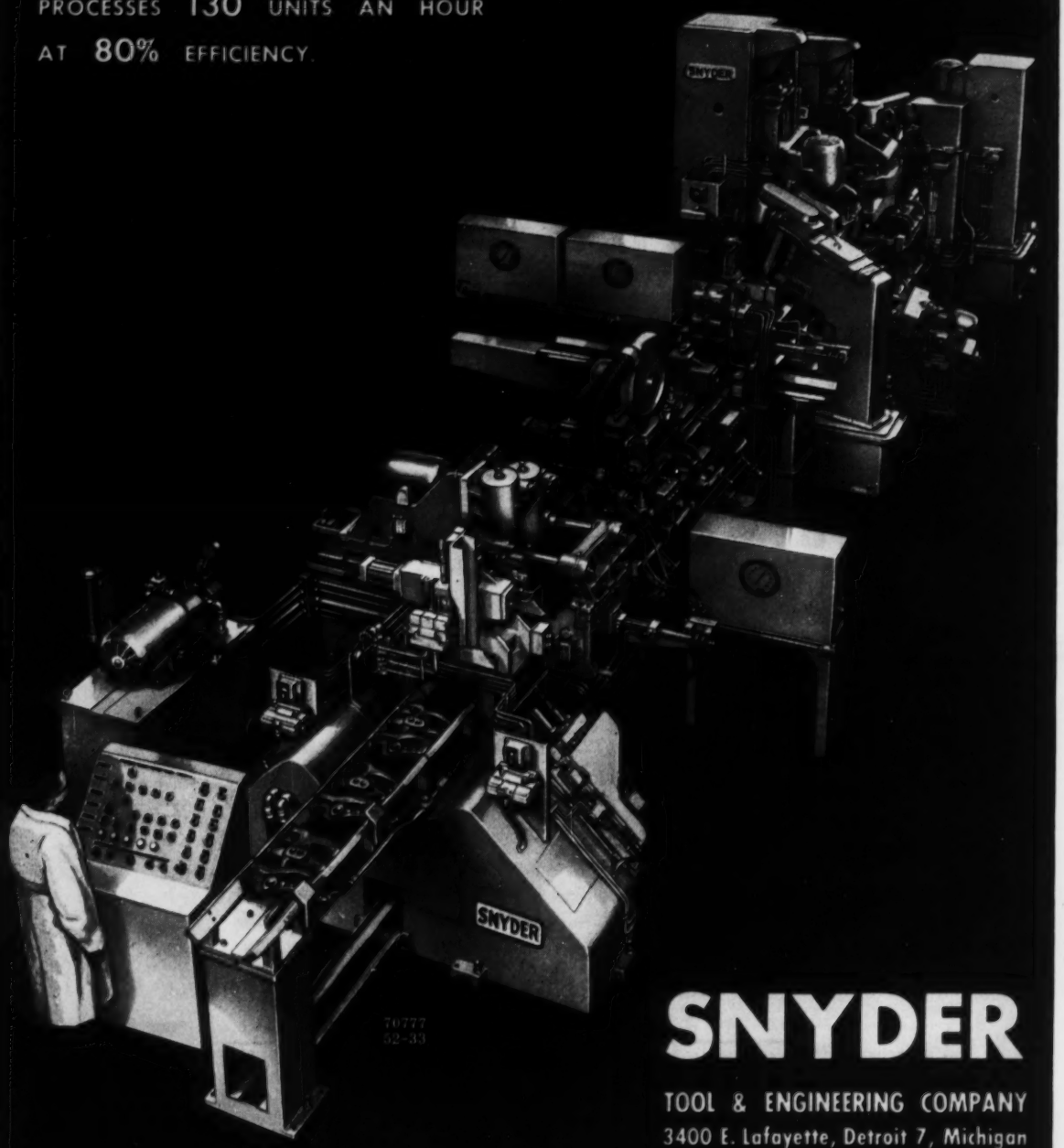
BAKELITE COMPANY
A Division of Union Carbide and Carbon Corporation
UCC
30 East 42nd Street, New York 17, N. Y.

In Canada: **Bakelite Company, Division of Union Carbide Canada Limited, Belleville, Ontario**

SNYDER SPECIAL

21-STATION AUTOMATIC LINE

TRANSFER MILLS, DRILLS, CORE-DRILLS, REAMS AND TAPS INTAKE MANIFOLDS; TESTS MANIFOLD FOR AIR LEAKAGE AND VOLUMETRIC AIR FLOW, INSPECTS PROCESSING PROGRESSIVELY, MARKS REJECTS; INSERTS HEATER TUBES; PROCESSES 130 UNITS AN HOUR AT 80% EFFICIENCY.



SNYDER

TOOL & ENGINEERING COMPANY

3400 E. Lafayette, Detroit 7, Michigan

29 Years of Successful Cooperation with Leading American Industries

Here's how you save

WITH THE

DU PONT SODIUM HYDRIDE DESCALING PROCESS

1. SHORT TIME CYCLE

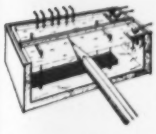
Only 15 seconds are required to get cold reduced-annealed strip clean and bright —10 to 20 minutes for fabricated articles, sheets, wire, rods, bars and forgings. Even heavily scaled forgings (½" scale thickness) take less than an hour!

2. NO LOSS OF BASE METAL

There's no danger of costly rejects due to pitting, etching, or loss of gauge with the Du Pont process—no matter how long work is left in the bath. This permits working to closer tolerances and assures high dimensional accuracy.

3. RETREATMENTS RARELY NEEDED

One pass through the sodium hydride bath will do the job completely. You can maintain uniform speed in production-line descaling. Quick completion of orders means you can substantially cut down on inventory in process.



4. SIMPLIFIED PROCESS

No scale-breaking or special racking procedures are required. Finished stock of any size or shape can be completely descaled with the versatile Du Pont process. Even dissimilar metals can be treated in the same bath—at the same time!

5. EASY TO OPERATE

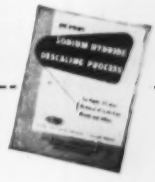
Any pickler can be trained in a few hours to run the Du Pont Sodium Hydride Descaling Process effectively. You can do more work with fewer men and less equipment. And you save on time, space and labor costs.

6. DU PONT TECHNICAL SERVICE

If you are descaling metals which are unaffected by fused caustic at 700°F., it will be to your advantage to talk with us about the Du Pont Sodium Hydride Process. Du Pont pioneered this modern descaling method and can bring a depth of technical experience to bear on your descaling problems. There's no cost for this service which includes laboratory investigation of problems plus expert aid in the construction, installation and operation of the process. Just call our nearest district office or send in the coupon below.

SEND FOR FREE BOOKLET describing the Du Pont Sodium Hydride Descaling Process—how it works—what it can do for you. This illustrated booklet lists the metals that can be descaled with this remarkably efficient process . . . gives brief descriptions of necessary equipment and operating precautions. Just fill out and mail the coupon below for your copy. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

DISTRICT AND SALES OFFICES: Baltimore • Boston Charlotte • Chicago • Cincinnati • Cleveland • Detroit Kansas City* • Los Angeles • New York • Philadelphia Pittsburgh • San Francisco *BARADA & PAGE, INC.



DU PONT
Sodium hydride process for positive descaling

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

MAIL THIS COUPON FOR FREE BOOKLET

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department S-10
Wilmington 98, Delaware

☐ Please send me your free booklet on Sodium Hydride Descaling.

☐ Please have one of your technical men call. I am interested in descaling_____.

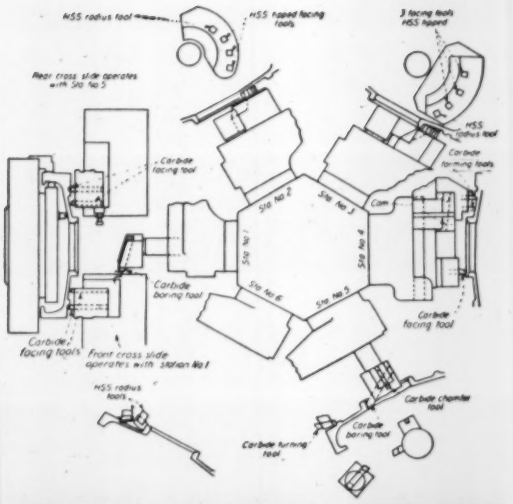
*Name*_____ *Position*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

how *Curtiss Wright* increases production



Note setup using both HSS and carbide tools to handle rough and finish cuts including 2 stations which sweep a circular swath about 2" wide.

with the

FASTERMATIC

automatic turret lathe

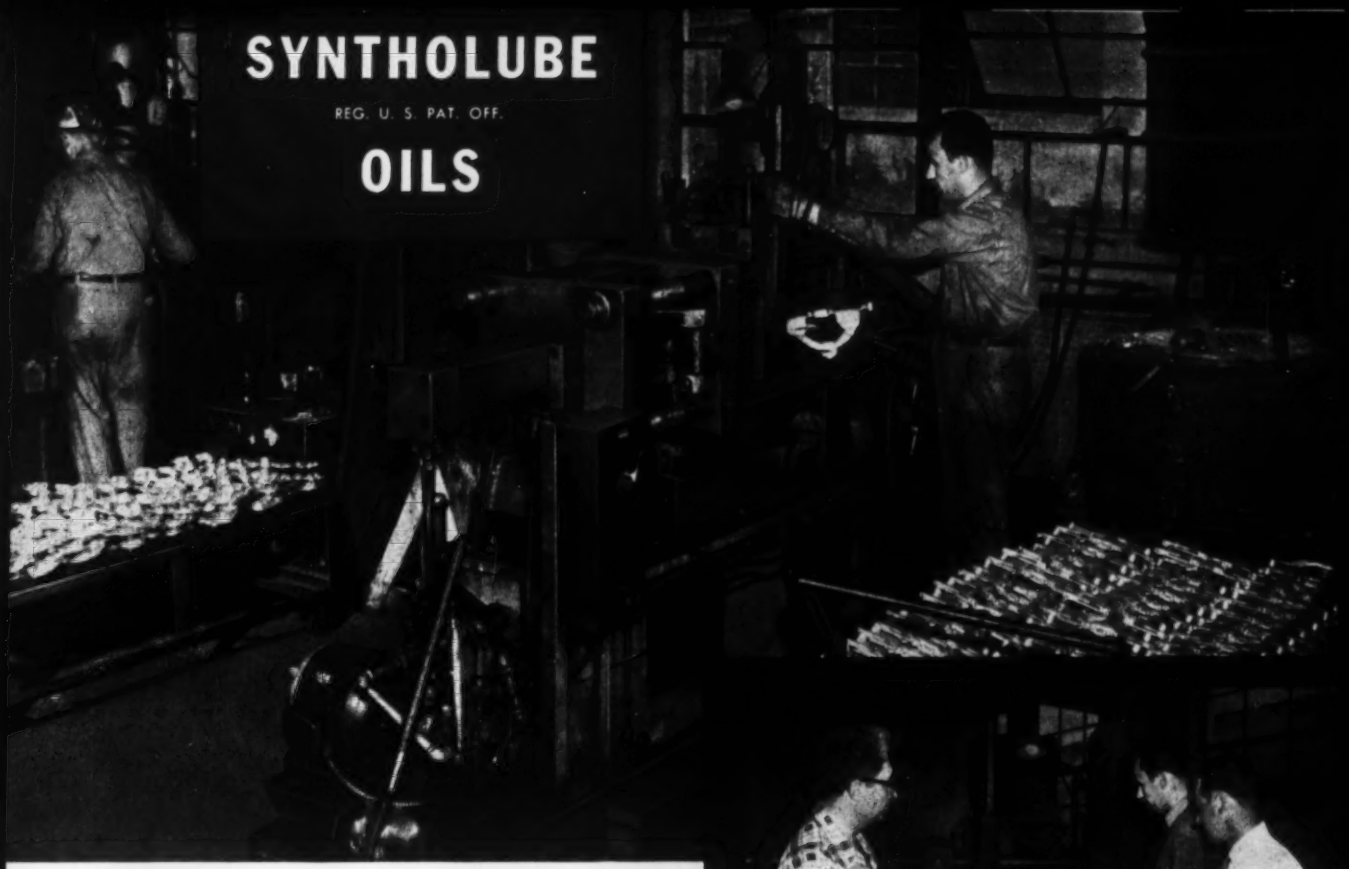
It's a complex machining job, this front end section for an aircraft engine. But the Fastermatic does it at a fast rate, handling 20 cuts in 37 minutes. That's because the Fastermatic has the rigidity to take multiple cuts at high speeds with carbide tools. What's more, it's all automatic operation.

Once the job is set, the machine does all the work—efficiently, and with repeat accuracy, piece after piece. Why not find out what it can do to increase your production and cut your costs?

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES



Beats heat in die casting machines . . .

Mr. Simon Slutsky (left), co-owner of Atlantic Die Casting Company, and Mr. L. J. Loomis (extreme right), Standard's lubrication specialist, watch machine operator use the somewhat unique spray method devised to apply SYNTHOLUBE Oil to hot and hard-to-lubricate parts of die casting machine.

● The Atlantic Die Casting Company specializes in aluminum die casting. Using hydraulic machines of its own design, this company turns out amazingly intricate parts at a high rate of production. But it was not always easy going.

There had been a problem of lubrication. The exceedingly high temperatures necessary for die casting made it difficult to lubricate machine parts in the area of the heated dies. Various expensive and complicated lubricating mixtures were tried. Under the high temperatures, the lubricants thinned and did not cling well to the hot surfaces. Oxidation of the lubricants produced deposits. Resulting troubles: sticking of machine parts, particularly ejector pins; staining of aluminum castings, down-time for cleaning.

Consulted on this problem, a Standard Oil lubrication specialist recommended the lubricant that had been developed by Standard Oil for just such high temperature applications: SYNTHOLUBE Oil.

This unique product has made short work of the lubrication troubles. It does not "run" from hot surfaces. Its unusual depolymerizing characteristic has prevented the formation of troublesome deposits. In addition to other lubricating benefits, SYNTHOLUBE has eliminated the expense of using costly lubricating mixtures.

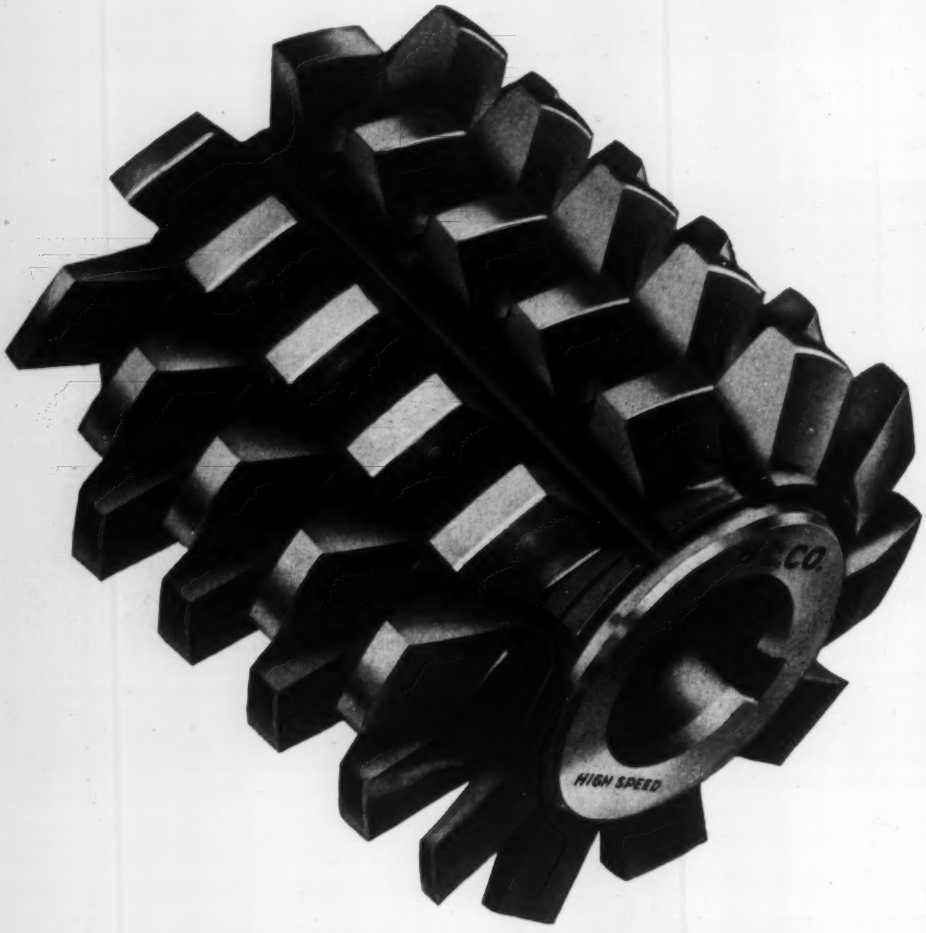
Whatever your lubricating problem or need, you'll find that a Standard Oil lubrication specialist has the engineering ability and the petroleum product to help you. You can reach the specialist serving your area of the Midwest by phoning your local Standard Oil office. Or, write: Standard Oil Company, 910 So. Michigan Ave., Chicago 80, Ill.

STANDARD OIL COMPANY STANDARD *(Indiana)*

Barber-Colman

HOBS

designed for gear tooth accuracy, long cutting life, new feeds and speeds



An expertly designed hob gives finer quality gears, more gears per hob life, and lower cost per cut gear.

New heat treating techniques and production equipment used in the manufacture of Barber-Colman Hobs result in superior gear cutting performance.

Call your Barber-Colman representative for help on cutting spur or helical gear teeth, splines, serrations or special forms.

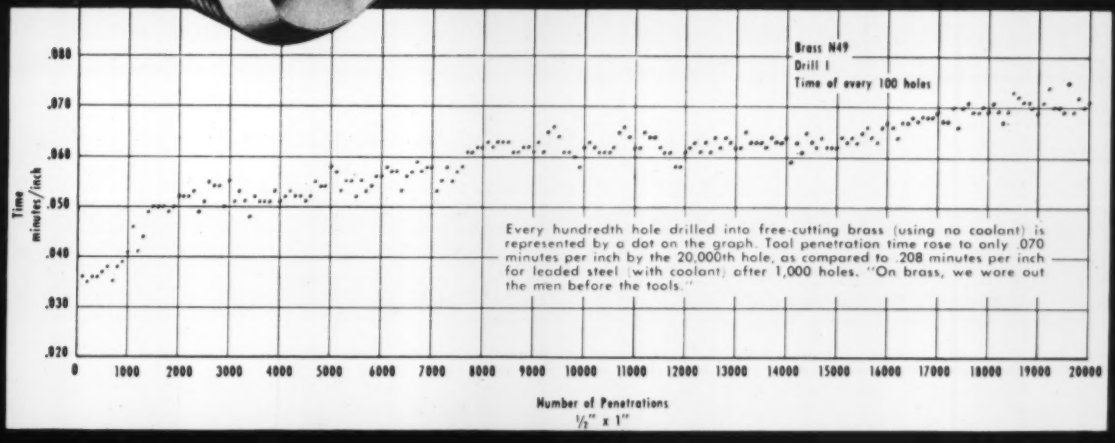
BARBER COLMAN

Barber-Colman Company *hob pioneers in*

ultra-fine pitches
multithread hobs
accurate unground hobs
precision class aa hobs

GENERAL OFFICES AND PLANT: 7610 ROCK STREET, ROCKFORD, ILLINOIS

Left—condition of drill after 1,000 holes in leaded steel (with coolant); right—condition of drill after 20,000 holes in free-cutting brass (no coolant).



exhaustive 20,000-hole drill test proves superior machinability of brass rod...

Is leaded steel as machinable as brass?

Lack of scientific machining data comparing these two metals prompted Titan to launch extensive research—not only in the laboratory but on the production line.

In a closely-controlled Constant Pressure Drilling Test using no coolant, the time to drill a ½"-diameter, 1"-deep hole in leaded steel increased 93.5% by the 200th hole. Penetration time for brass had increased only 6.45%. On this basis, brass was 14 times more machinable.

But Titan metallurgists went further. In an exhaustive effort to wear the drilling tool on brass to the same extent that 1,000 holes in leaded steel (with coolant) had worn it, a total of 20,000 holes were drilled in brass (using no coolant). Penetration time was only .070 minutes per inch for brass *after 20,000* holes as compared to .208 minutes per inch for leaded steel *after 1,000 holes.*

It was impossible to wear out the tool drilling 20,000 holes in brass. The test was stopped. "We wore out the men instead."

Read about Titan automatic screw machine production results comparing brass and leaded steel booster bodies. Send for free 48-page booklet titled "First Report." Use coupon below:

Dept. C

Titan Metal Mfg. Co., Bellefonte, Pa.

Gentlemen: Please send free booklet titled "First Report" about brass machinability.

Name_____

Title_____

Company_____

Street_____

City & State_____

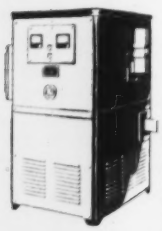
Titan

METAL MANUFACTURING COMPANY

Bellefonte, Pa. Offices and Agencies in Principal Cities

AMPERES BY THE MILLIONS

Udylite pioneered the first standardized rectifier for the plating industry in 1940. To date 26,000,000 amperes have been sold and installed.

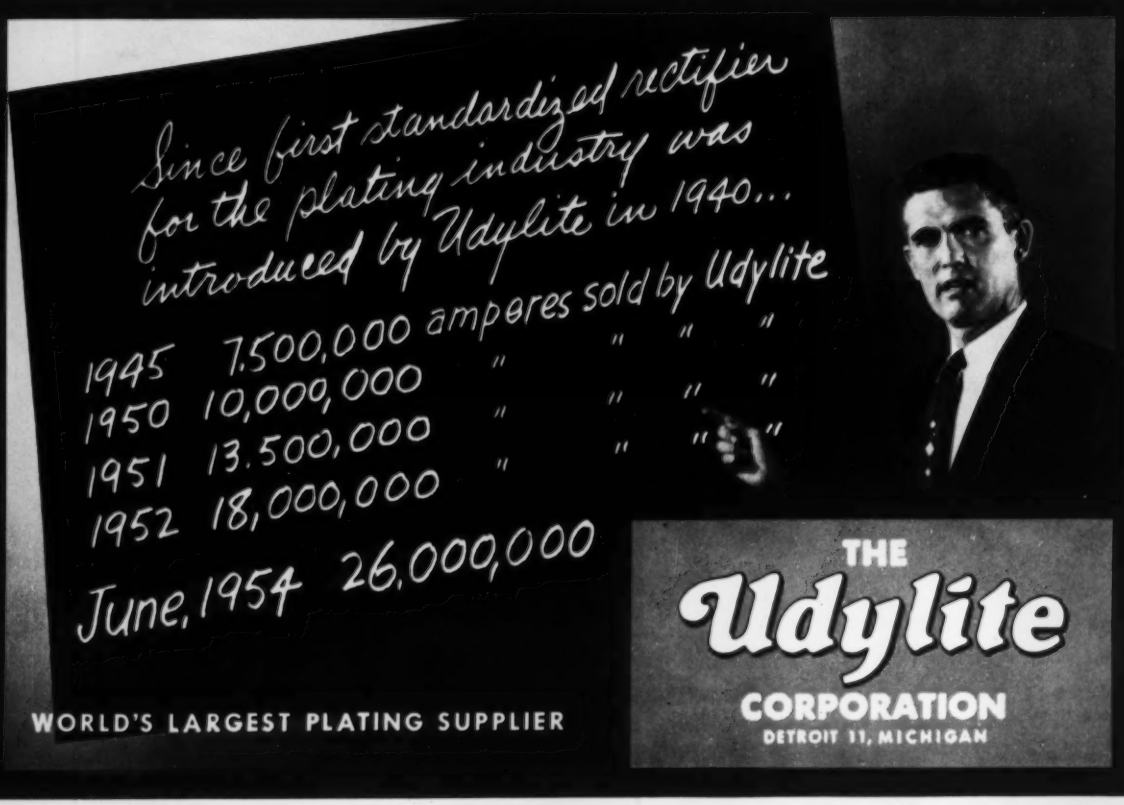


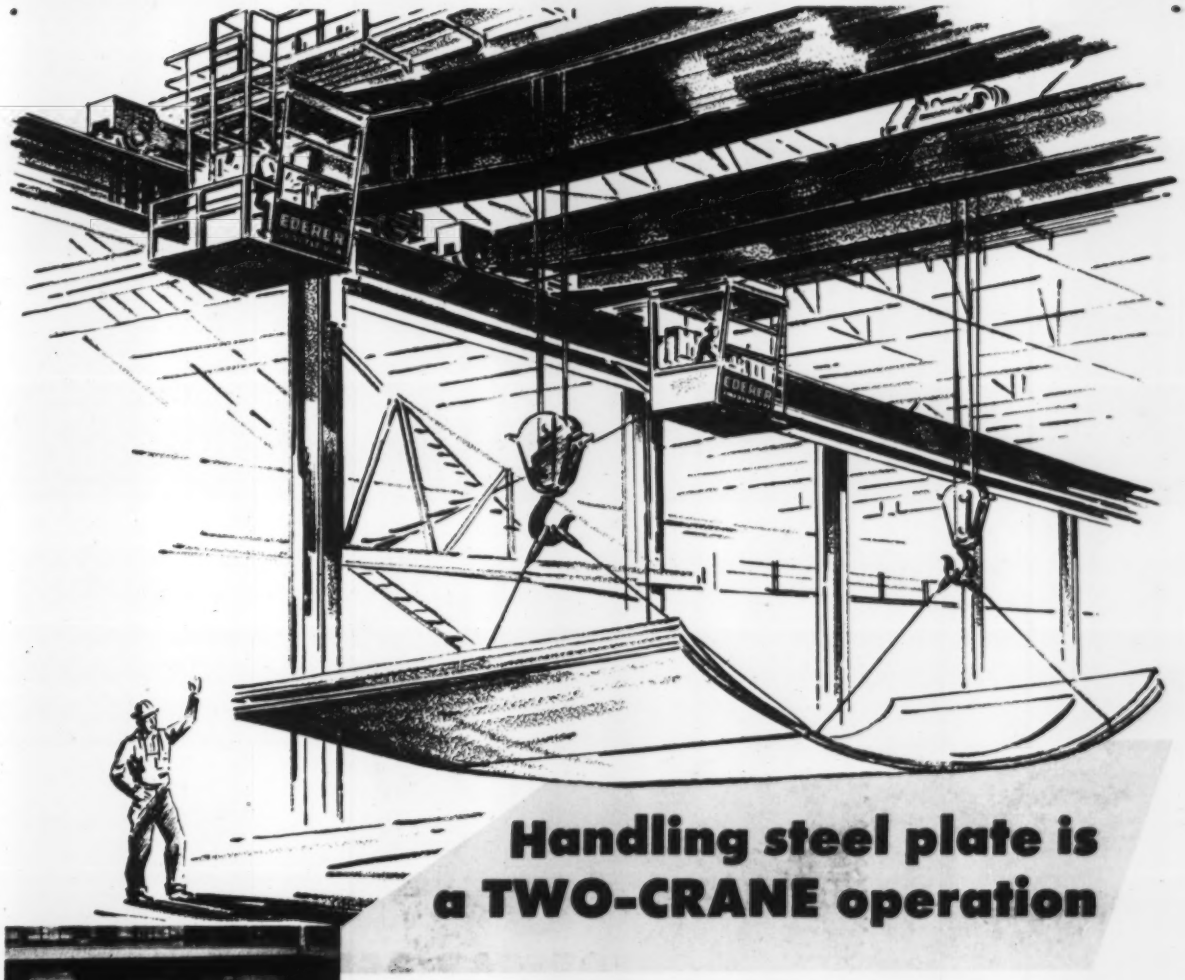
Yes, it's know-how that counts. Back fourteen years ago when Udylite brought out the first magnesium-copper-sulphide rectifier the capacity was 1500 amperes, 6 volts. Many of these rectifiers are still in operation today. But great progress has been made in the application of electrical power to plating operations since 1940. Through research Udylite electrical engineers have developed and improved selenium rectifiers.

Udylite's complete line of first quality selenium rectifiers range from the bench-type furnishing 25 amperes to big banks of rectifiers with output up to 100,000 amperes. But building a good rectifier is only part of the job. The *application* is equally important. That's why Udylite "know-how" helps you. When you buy Udylite rectifiers you can be sure that the application is right, and your power is used efficiently.

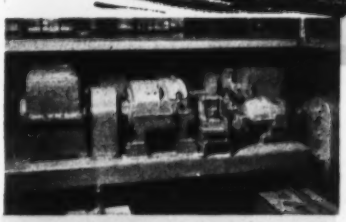
Thousands of plating customers have learned the importance of Udylite application "know-how". That's why our rectifier sales increase each year. Yes, that's why we have sold 26,000,000 amperes of rectifiers since 1940.

If you need rectifiers for electro-plating, electro-cleaning, electro-polishing, anodizing or hard coat process call your Udylite representative or write direct to . . . The Udylite Corporation, Detroit 11, Mich.


Since first standardized rectifier for the plating industry was introduced by Udylite in 1940...
1945 7,500,000 amperes sold by Udylite
1950 10,000,000 " " " "
1951 13,500,000 " " " "
1952 18,000,000 " " " "
June, 1954 26,000,000
WORLD'S LARGEST PLATING SUPPLIER
THE
Udylite
CORPORATION
DETROIT 11, MICHIGAN



Handling steel plate is a TWO-CRANE operation



Standard single-hook trolley has AC-DC controls with speed variator controls on hoist for easy adjustment to any speed.

Cast steel hoist gear case contains alloy steel gears and forged steel pinions. All gears and pinions have machine-cut teeth and are heat-treated.

In some instances where EDERER has "job-engineered" cranes to the specific requirements of a plant, one of the requirements was for two cranes with speeds synchronized for "tandem" operation in handling extra heavy loads. This is only one of the many ways in which EDERER engineers and builds cranes to do any type of work in any industry.

No matter what YOUR requirements—no matter what YOUR industry—EDERER can "job-engineer" a crane to do the job for you. This—with the basic "plus" in all EDERER-built cranes of heavy-duty construction throughout—assures you capacity performance—minimum maintenance—lower cost-per-ton materials handling. You'll want more specific details . . . why not send for EDERER industrial crane catalog—Bulletin CR-610?

274C54

EDERER

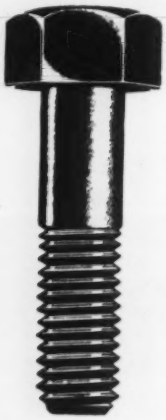
CRANES

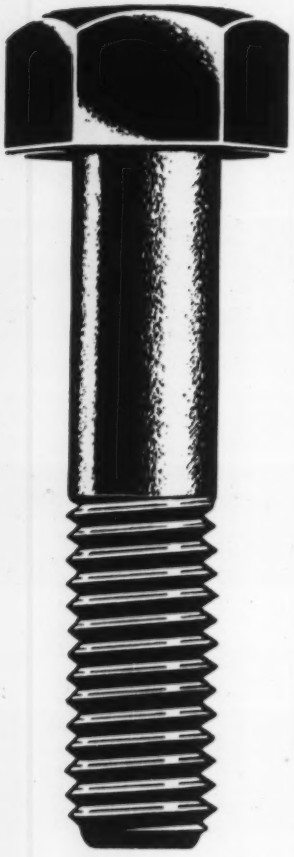
EDERER ENGINEERING COMPANY • 2935 First Ave. S., Seattle 4, Wash.

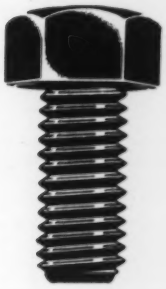
Export Division: 301 Clay St., San Francisco 11, Calif.

OVER 50 YEARS "JOB-ENGINEERING" CRANES FOR INDUSTRY

maximum service and dependability...







FOR CAP SCREW USERS

Republic Hex Head Cap Screws are made right from head to thread. They are furnished in low carbon or 1040 heat treated steel.

Heads have sharp corners to take wrenches snugly. They are strong to avoid slippage on tough pull-ups. Washer face under head provides full bearing surface.

Shanks are tough and sturdy to withstand shock and vibration.

Threads are clean, sharp and accurate with full engaged thread area.

Hex Head Cap Screws are just one of more than 20,000 regular types, styles and sizes of highest quality fasteners made by Republic for all industries.

REPUBLIC STEEL CORPORATION
Bolt and Nut Division • Cleveland 13, Ohio
Plants at Cleveland, Ohio and Gadsden, Alabama
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

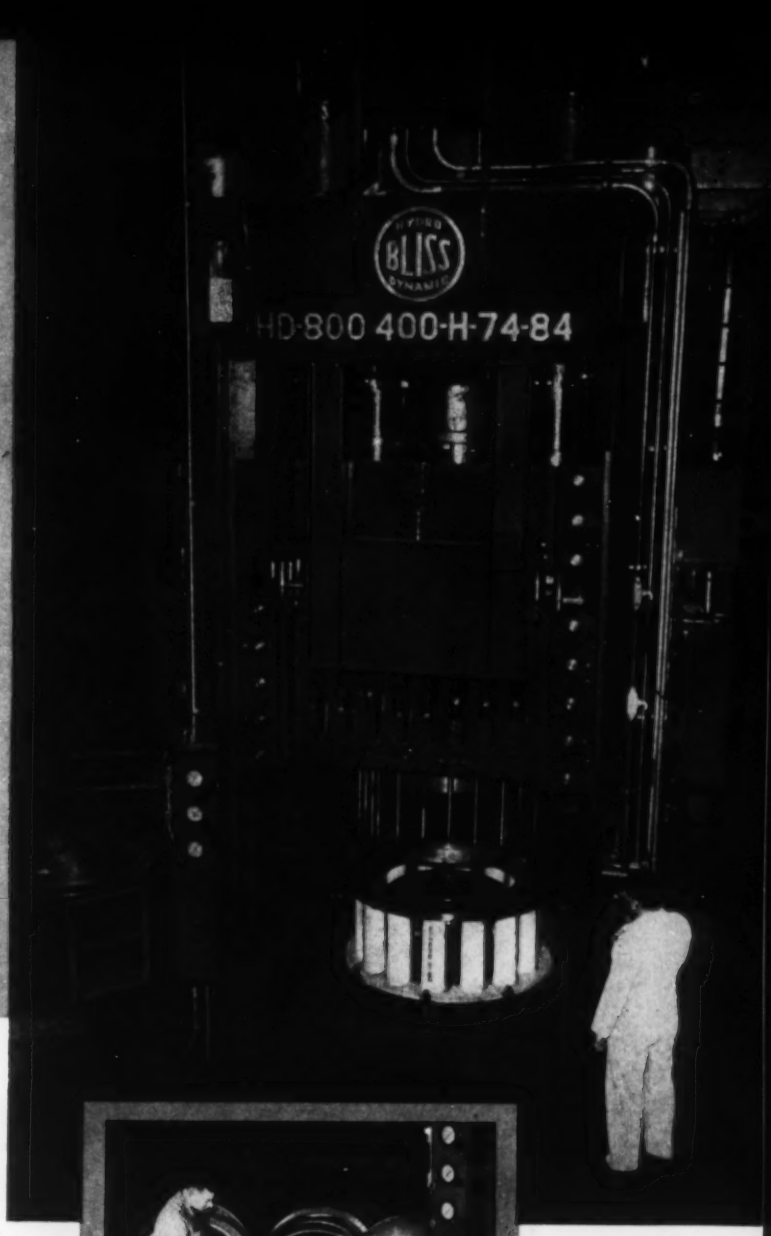
REPUBLIC BOLTS AND NUTS

REPUBLIC STEEL

Other Republic Products Include Steel and Plastic Pipe, Tubing, Lockers, Shelving—Carbon, Alloy and Enduro Stainless Steels—Titanium

DOUGLAS AIRCRAFT LICKS A TOUGH ONE . . .

uses 800-400-ton Bliss Hydro-Dynamic Press to cut reject rate by 68%



FACED with a better than 70% reject rate on 52-in. diameter aluminum shells, a west coast sub-contractor almost sunk the project and himself in the bargain.

The part required a difficult deep draw—and then halfway through the draw cycle—a stretch into the final shape. Despite the stretch, the wall had to be held to a close tolerance.

To solve the problem, Douglas and Bliss engineers collaborated on the design of a special Bliss Double-Action Hydro-Dynamic Press—one which has a 100% pin pattern on the blankholder to give positive holding pressure all around the blank. That feature, plus precision guiding of the slide and accurate tooling, did the trick . . .

Rejects were cut to less than 2%

You can expect results like that when you use the right press for the job. It may be a single-, double- or triple-action press. It may require a rubber pad set-up. It may be a standard or a special-purpose press. But no matter what your problem, you can be sure of impartial counsel from your Bliss press engineer. Bliss, world's largest manufacturer of presses, makes both mechanical and hydraulic—grinds no ax for either—only for the *one* proper press.

For HYDRAULIC Presses, too ... it pays to specify BLISS

BLISS
SINCE 1857

is more than a name . . . it's a guarantee!

E. W. BLISS CO., Canton, Ohio
PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Subsidiary: The Die Supply Company, Cleveland, O. • E. W. Bliss (England) Ltd., Derby • E. W. Bliss Company (Paris) France

U. S. Plants* in Canton, Salem and Toledo, Ohio; Hastings, Michigan; and San Jose, Calif. *Branch Offices* in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo; and Toronto, Canada. *Other representatives throughout the world.

CUT STEEL

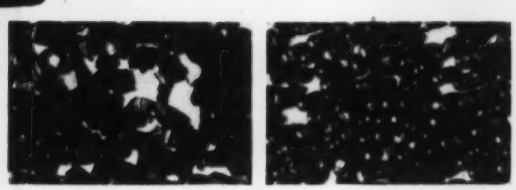
SLASHED OUR CLEANING COSTS AS MUCH AS 65% PER WHEEL-HOUR

The above cost analysis figure was included in a report recently received from a prominent manufacturer of farm equipment, one of the first users of Metal Blast's new CUT STEEL abrasive. The report also states that CUT STEEL produced a better finish than ever obtained before.

CUT STEEL is an entirely new type of abrasive. It is composed of small particles cut from high grade alloy steel. It work-hardens in use—actually becomes harder the longer it's used.

For scores of foundries, it is cleaning faster, better and lasting longer than any other abrasive. Yet, Grade "A" CUT STEEL costs *less than most cast steel shot,* and Grade "B" *no more than malleable shot.*

If you're concerned about cleaning costs and the appearance of your castings—by all means investigate CUT STEEL! Samples, literature, trial orders gladly, on request.



CUT STEEL changes shape in usage. Its original form is grit-like, with sharp edges and corners. But in production, it rapidly changes to a spherical shape, in a variety of sizes. The smaller pellets contribute to its efficiency by penetrating to even the hardest-to-reach parts of castings.

SOONER OR LATER, YOU TOO, WILL CHANGE TO **CUT STEEL**

METAL BLAST, Inc.

872 EAST 67th ST., CLEVELAND 3, OHIO

manufacturers of ANNEALSHOT, SUPER-ANNEALSHOT, CUT STEEL ABRASIVES

Republic Aviation operates P&H high-frequency welders as standard metallic arc welders, also, so that duplicate equipment does not have to be purchased.

More than doubles welding speed with P&H

30 P&H TH-200 high-frequency machines make inert gas arc welding 2½ to 3 times faster than former gas welding at Republic Aviation Corporation

No replacement maintenance in three and a half years of two-shift operation

You don't have to take our word for the outstanding performance record of P&H Welders. The following statements are actual quotes from a certified report issued by the H. P. Gould Co. of Chicago, who made an impartial study of welding operations at Republic Aviation Corporation, Farmingdale, L. I., N. Y.

"In the building of faster and better aircraft, new developments in welding have played an important part and P&H high-frequency inert gas welding has proved that it can solve the problems of welding aluminum alloys.

"Three and a half years ago, Republic Aviation tested P&H TH-200 HF Inert Gas AC Arc Welders, and evaluated them against the existing equipment in the plant, as well as against outside competition.

"P&H welders of four different types are now used in four locations in the plant, for the welding of hundreds of different parts. In general, they are welding aluminum alloys from .032" thickness up to .250", and heat-resisting alloys from .010" up to a thickness of .093". For arc-welding alloy steels (4130, 4140, 8630, 8740, etc.), experience has proved P&H electrode AW-4 most satisfactory, and it is used exclusively.

"Republic Aviation welding engineers back up the claim of the makers that P&H welders require very little maintenance. The 30 high-frequency arc welders have had no replacement maintenance whatever in three and a half years of two-shift operation — and the operating cost of each P&H TH-200 HF Welder is only 40¢ per day."

Like Republic Aviation, whose studies show P&H inert gas arc welding to be 2½ to 3 times as fast as former gas welding you, too, can enjoy the money-saving advantages of P&H Arc Welders with Dial-lectric Control. You, too, can get faster, better welds at lower cost.

We've given you the Republic Aviation story in a nutshell! You can get all the detailed facts and figures by reading Gould Report No. 5311. Write for your copy today.

P&H WELDING DIVISION

HARNISCHFEGER CORPORATION

4411 WEST NATIONAL AVE. • MILWAUKEE 46, WIS.

the P&H Line

TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PREFABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

P&H welding equipment is manufactured and sold in Canada by
REGENT EQUIPMENT MANUFACTURING COMPANY LTD.
455 King Street West • Toronto, Ontario, Canada

2800A

ELECTROMET

TRADE-MARK

CHRO

YOU HAVE A CHOICE OF

SIMPLEX low-carbon ferrochrome—containing maximum 0.010% or maximum 0.025% carbon. Available with silicon contents of 5.00 to 7.00% or maximum 1.50%.

SIMPLEX nitrogen-bearing, low-carbon ferrochrome—in 2% and 5% nitrogen grades.

Low-carbon ferrochrome—with carbon grades ranging from 0.02 to 2.00% maximum.

Nitrogen-bearing, low-carbon ferrochrome—with grades containing 0.75 to 2.00% nitrogen.

High-carbon ferrochrome—with carbon grades ranging from 3.00 to 7.00% maximum.

Low-chromium, high-carbon ferrochrome—in maximum 5.00% and maximum 6.00% carbon grades.

High-carbon ferrochrome—of 7.00% minimum carbon content.

"SM" ferrochrome—containing 4.00 to 6.00% carbon.

Exothermic ferrochrome and exothermic silicon-chrome.

Ferrochrome-silicon.

Ferrosilicon-chrome.

Electrolytic chromium metal—with minimum chromium content of 99.00%.

Foundry ferrochrome—high- and low-carbon grades.

Chromium briquets—each containing 2 pounds of chromium.

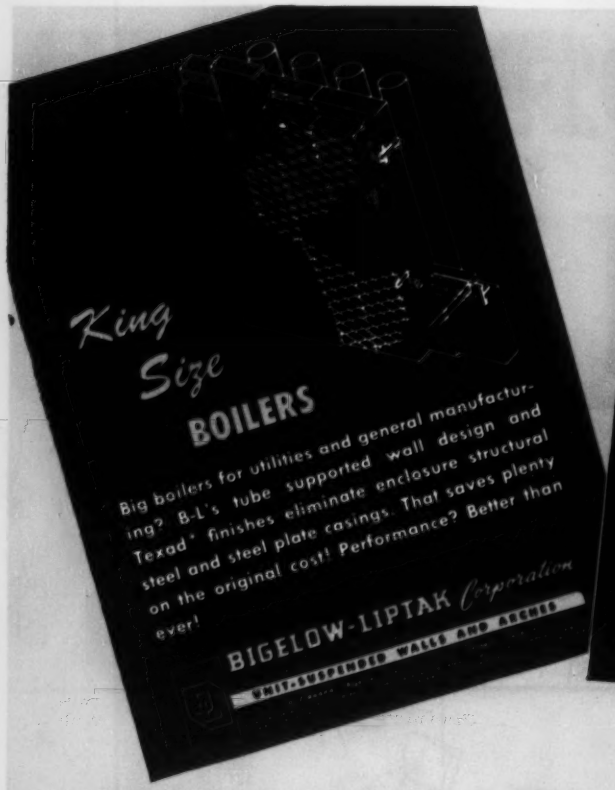
The terms "Electromet," "Simplex," and "SM" are trade-marks of Union Carbide and Carbon Corporation.

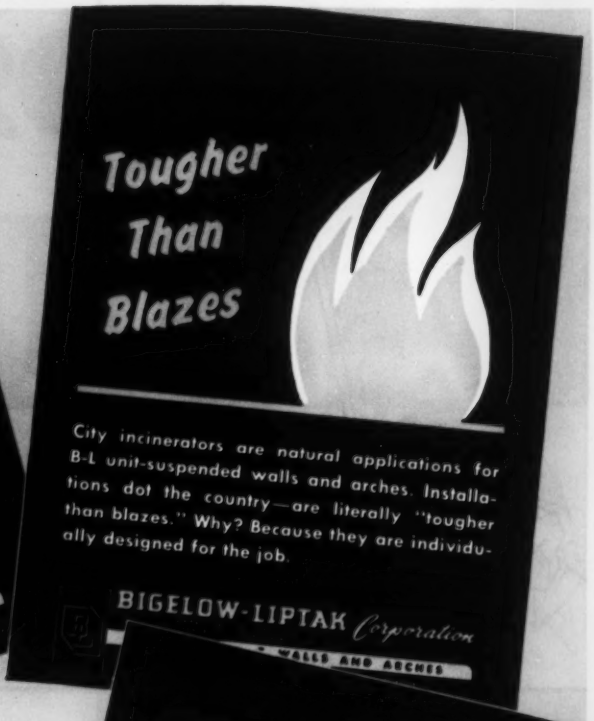
35 GRADES

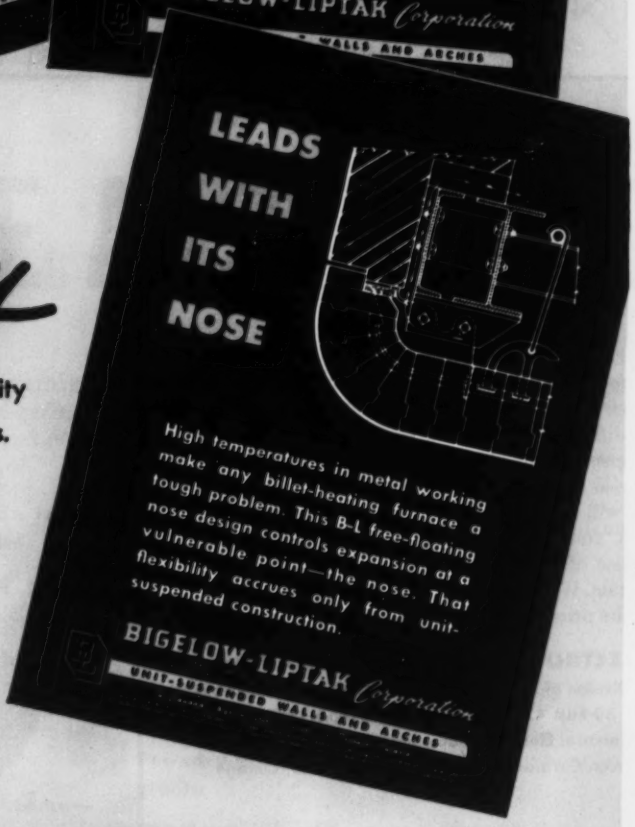
From no other source can you get as many types of chromium products. ELECTROMET has 35 different grades, and each is designed to do a specific job. Let one of our metallurgists advise on the grade best suited to your needs. He will be glad to assist you with any problems that you have on the production, fabrication, or use of quality steels, irons, and non-ferrous metals. Write or phone one of our offices, located in the principal steelmaking centers.

ELECTRO METALLURGICAL COMPANY

A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
In Canada: Electro Metallurgical Company, Division of Union Carbide Canada Limited, Welland, Ontario


King Size
BOILERS
Big boilers for utilities and general manufacturing? B-L's tube supported wall design and Texad* finishes eliminate enclosure structural steel and steel plate casings. That saves plenty on the original cost! Performance? Better than ever!
BIGELOW-LIPTAK Corporation
UNIT-SUSPENDED WALLS AND ARCHES


Tougher Than Blazes
City incinerators are natural applications for B-L unit-suspended walls and arches. Installations dot the country—are literally "tougher than blazes." Why? Because they are individually designed for the job.
BIGELOW-LIPTAK Corporation


LEADS WITH ITS NOSE
High temperatures in metal working make any billet-heating furnace a tough problem. This B-L free-floating nose design controls expansion at a vulnerable point—the nose. That flexibility accrues only from unit-suspended construction.
BIGELOW-LIPTAK Corporation
UNIT-SUSPENDED WALLS AND ARCHES

Versatility

You'll find that versatility is an inherent quality in B-L's design for furnace walls and arches. Thermal problems—erosion hazards—desired end results—are factors that govern the final design. That's why you see so many B-L installations through industry. After all, they provide long, dependable service at a low, low cost. More information? Write today.

*REGISTERED TRADE MARK

BIGELOW-LIPTAK Corporation

AND BIGELOW-LIPTAK EXPORT CORPORATION
2550 WEST GRAND BOULEVARD, DETROIT 8, MICHIGAN

UNIT-SUSPENDED WALLS AND ARCHES

In Canada: BIGELOW-LIPTAK OF CANADA, LTD., *Toronto, Ontario*

ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DENVER • HOUSTON • KANSAS CITY, MO. • LOS ANGELES • MINNEAPOLIS • NEW YORK PITTSBURGH • PORTLAND, ORE. • ST. LOUIS • ST. PAUL • SALT LAKE CITY • SAN FRANCISCO • SAULT STE. MARIE, MICH. • SEATTLE • TULSA • VANCOUVER, B.C.

"For non-corrosive fasteners— your best bet is to call AMERICAN"

Actual Sizes

From small, stainless, decorative rosettes to aluminum refrigerator bolts, you can get *what* you need *when you need it* from American.

And just as important, you'll find that a call to American often results in getting lower cost fasteners for your job. For example, the aluminum refrigerator bolt shown here once involved expensive cutting operations. Now American cold-heads it, at a big saving to the customer.

We like to work that way with customers. We'd like to work that way with *you*. Send us your prints and a description of the fasteners you now use. We will work to make them do a better job for you, at less cost wherever possible. Just write to:

AMERICAN SCREW COMPANY

PHILLIPS HEADquarters — WILLIMANTIC, CONNECTICUT

Main Office & Plant — Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.

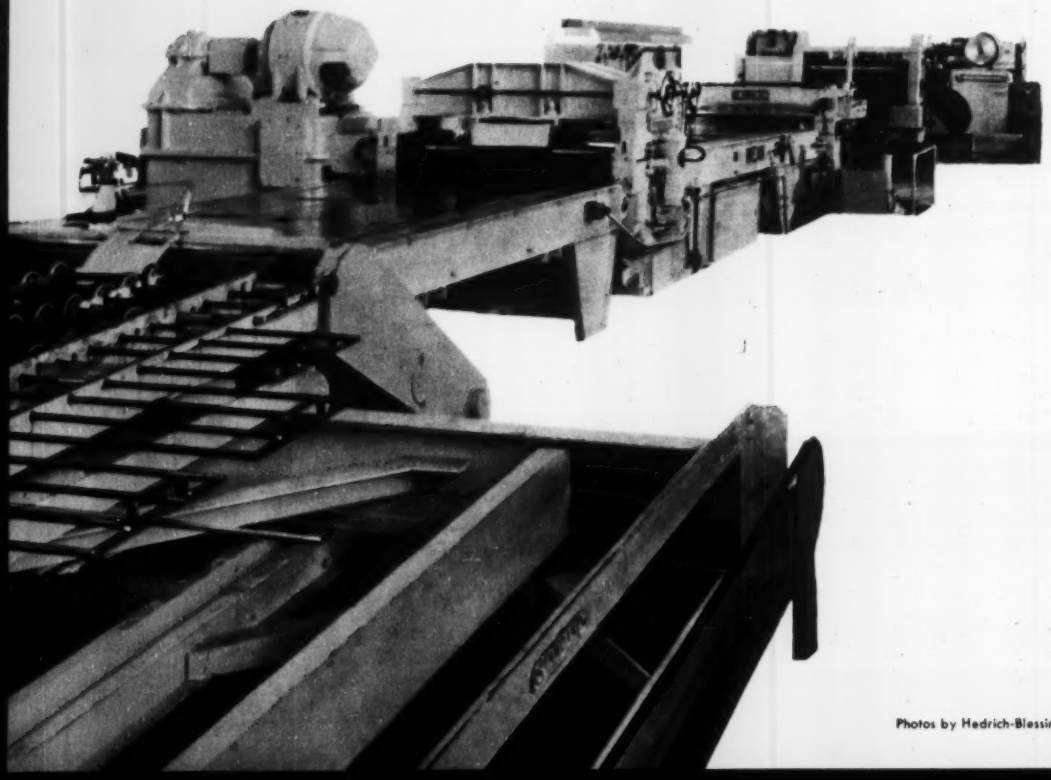
WEAN COMBINATION SLITTING AND SHEARING LINE REDUCES PRODUCTION COSTS FOR LYON METAL PRODUCTS

J. B. O'Connor

"We've noted savings made in raw material inventory; greater flexibility of inventory and improved service in our fabricating departments..."

To combat rising costs and meet increasing competition leading manufacturers in every field are giving modern production machinery a thorough going over.

Such was the case at Lyon Metal Products, Aurora, Illinois and York, Pa., one of the nations leading producers of sheet steel products. Months ago Lyon officials began to position themselves for the competition they knew to be inevitable. They reviewed their entire operation — studied every possible means of increasing production while curbing costs.



Photos by Hedrich-Blessing, Chicago

That's where Wean Equipment came into the picture. Wean knew their high production Slitting and Shearing Line was a natural for people like Lyon. They showed Lyon the sizable savings possible by buying coil stock directly from the mill, slitting and shearing to width and length desired. Lyon officials checked other Wean lines at work, cutting to resquared tolerances at 100 cuts or 200 feet-per-minute. Wean Equipment engineers pointed out the fact the users of this equipment required less warehousing, less stock control, that users paid less for their steel, had greater flexibility of their entire operation.

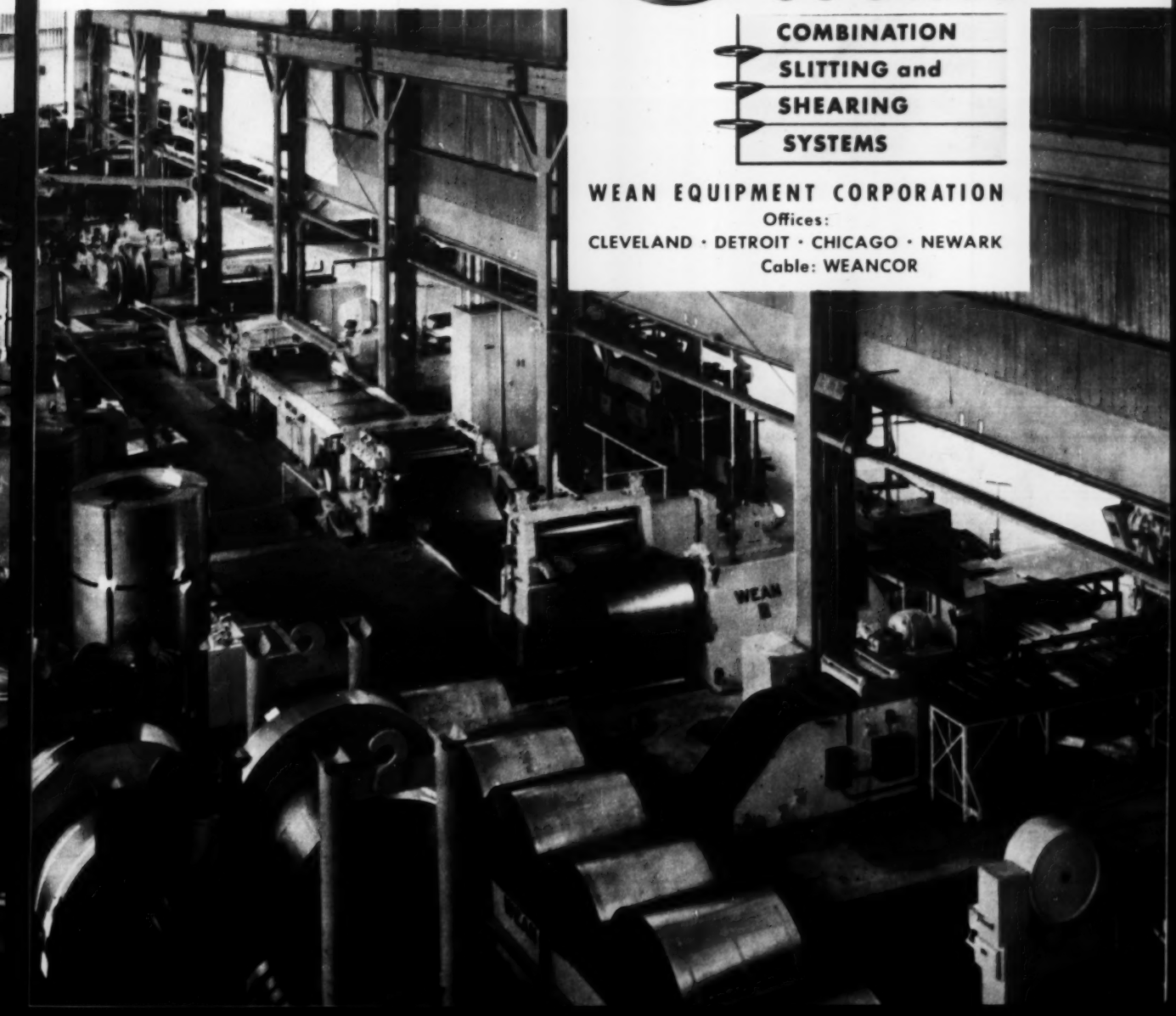
Lyon officials listened, compared figures, checked their costs and gave Wean the green light. Recently J. B. O'Connor, an official of Lyon Metal Products checked over the first three months Wean operation. He made the statement:

"We made a sizable saving in floor space, we accomplished a very much worthwhile reduction in our raw material inventory; we have much greater flexibility in that raw material inventory and perhaps more important, we are giving all of our fabricating departments a much improved service. We have every reason to believe that this will amortize itself in relation to expected returns on money invested."

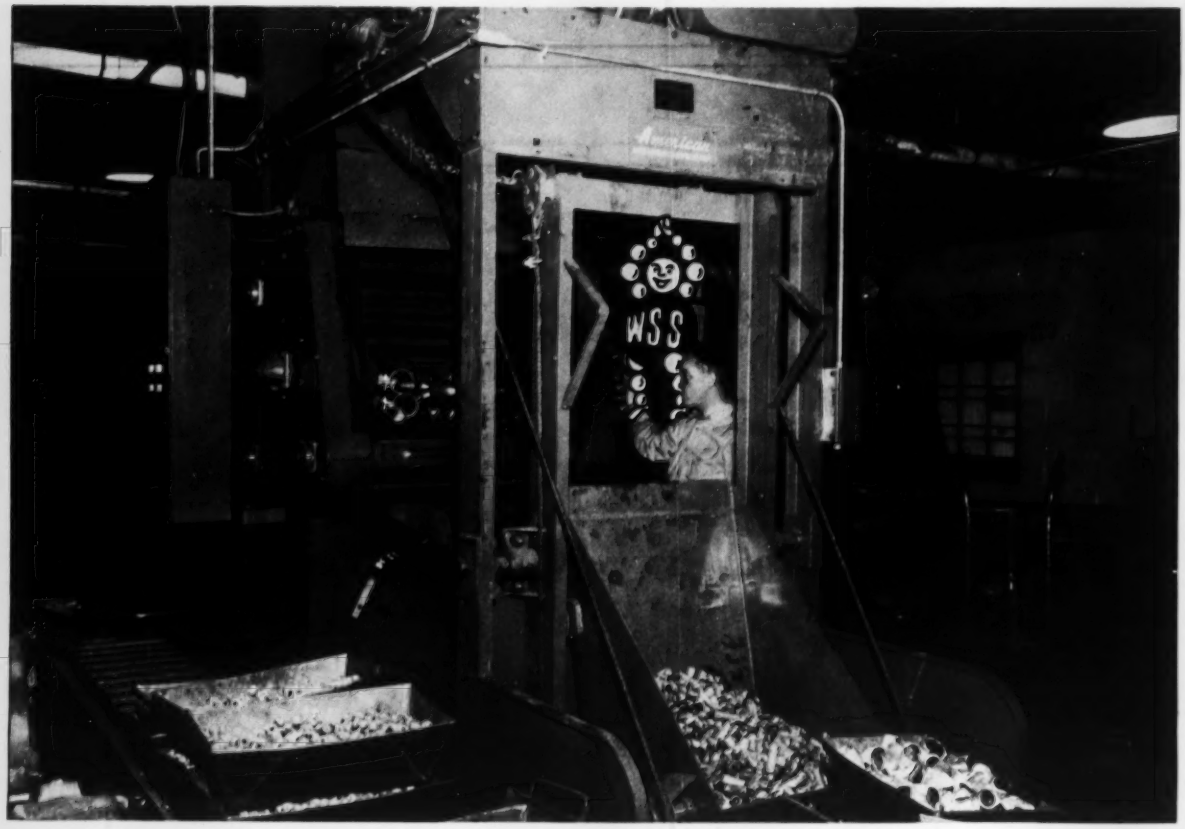
If you're in the business of manufacturing products requiring various widths and lengths of steel, like Lyon, it will pay you to talk with Wean Equipment — once you get the entire story we're sure you'll agree the savings possible, even for smaller users, make the Wean Line one of the best investments in modern metal working equipment.

COMBINATION
SLITTING and
SHEARING
SYSTEMS

WEAN EQUIPMENT CORPORATION
Offices:
CLEVELAND · DETROIT · CHICAGO · NEWARK
Cable: WEANCOR



pioneering developments keep WHEELABRATOR® STEEL SHOT first in abrasives



Wheelabrator® Steel Shot Wins on Every Count

Provides Lowest Overall Costs For Every Foundry Cleaning Operation

Wheelabrator Steel Shot cuts cleaning costs 56% over malleable iron shot at Swayne, Robinson & Co.

Slashes maintenance costs 70% over annealed iron shot at Gunite Foundries Corp.

Cuts abrasive costs 30% over malleable iron and another cast steel shot at Woodruff & Edwards, Inc.

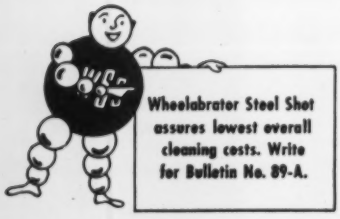
Slashes abrasive costs 50-60% over malleable iron shot at Unicast Corp.

Competitive abrasive tests made by these users and hundreds of others all ended in just one way! "On every count Wheelabrator Steel Shot is the best abrasive buy." These users have switched to this superior electric furnace steel shot, and are continuing its use, because of the many savings it is effecting in their operations —in abrasive consumption, increased production and decreased maintenance.

Combining hardness with toughness, Wheelabrator Steel Shot will clean or peen faster, at lower costs, than any other abrasive. Try it and prove it for yourself.

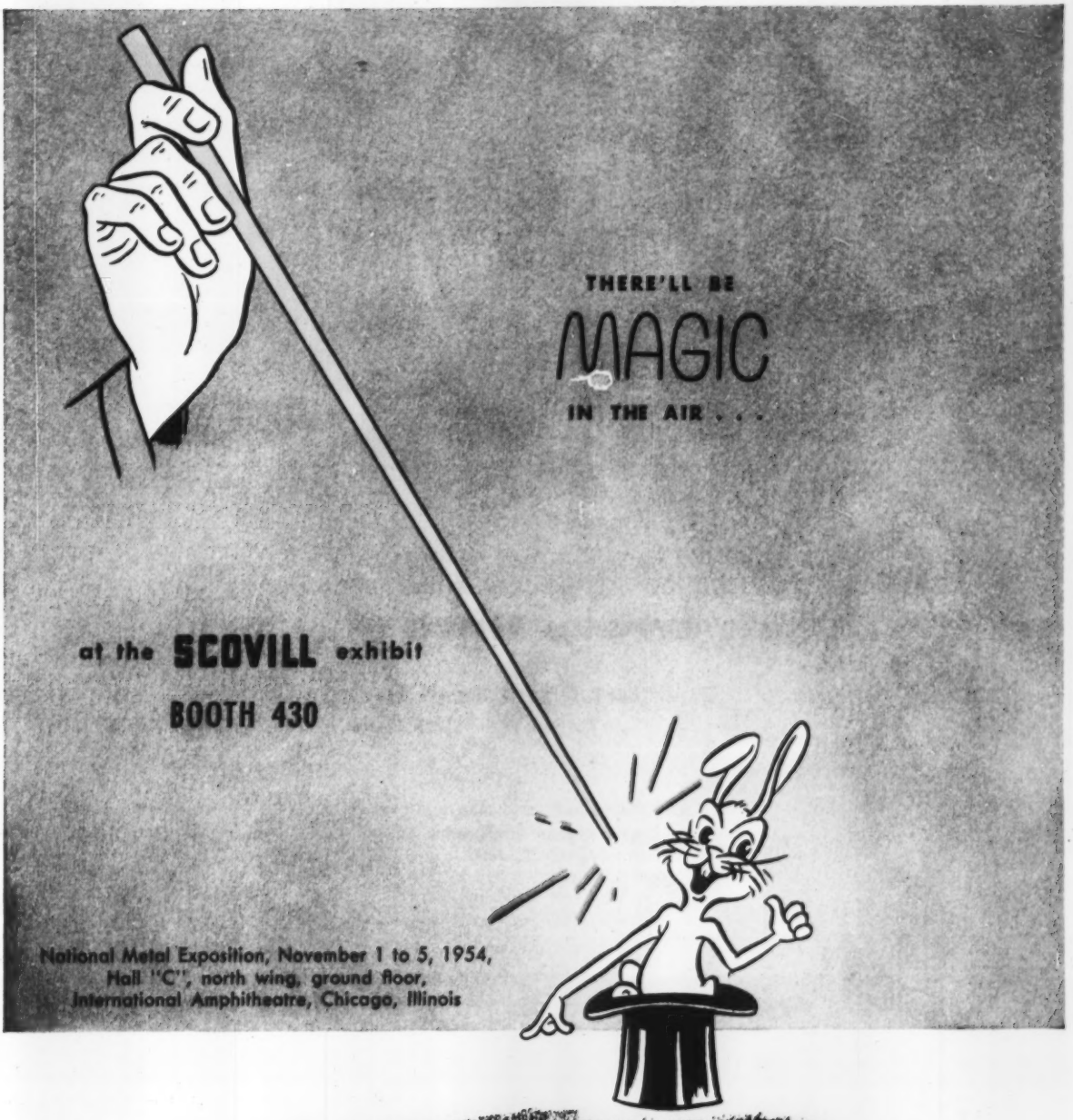
PLUS

50 lb. cartons and palletizing. A Scheduled Delivery Plan.



American
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka, Indiana

WHEELABRATOR STEEL SHOT


THERE'LL BE
MAGIC
IN THE AIR . . .
at the SCOVILL exhibit
BOOTH 430
National Metal Exposition, November 1 to 5, 1954,
Hall "C", north wing, ground floor,
International Amphitheatre, Chicago, Illinois

SCOVILL
HIGH SPEED
BRASS ROD
(FREE-CUTTING)
"MACHINES LIKE MAGIC"

SCOVILL MILL PRODUCTS

BRASS ★ BRONZE ★ NICKEL SILVER ★ ALUMINUM

SCOVILL MANUFACTURING COMPANY • MILL PRODUCTS DIVISION • WATERBURY 20, CONNECTICUT

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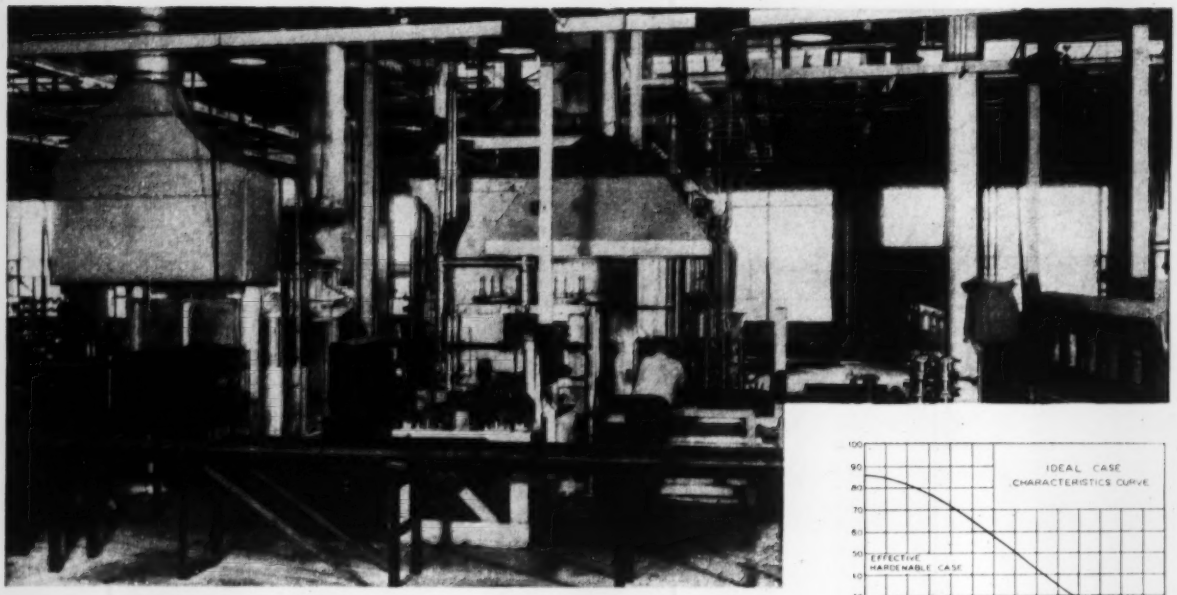
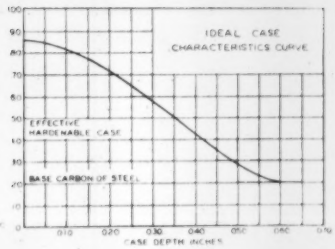
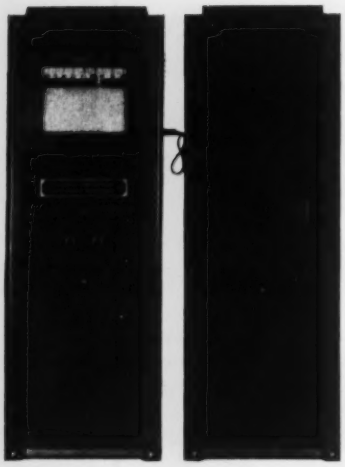




on the nose every time

WITH SURFACE AUTOCARB AUTOMATIC CARBON POTENTIAL CONTROL



New high physicals in carburized gears — better tooth-to-tooth and gear-to-gear uniformity—faster cycles—automatic compensation for changes in work surface area during furnace operation . . .

These are the chief benefits Warner Gear Division, Muncie, Ind., achieves in its most recent continuous gas carburizing line, using the 'Surface' fully automatic carbon potential control system. In a nutshell: The Surface dewpoint recorder-controller periodically checks carbon potential in each of three zones in the furnace (with a range of .3 to 1.1% carbon), controls mixing valves to deliver correct additions of air or gas to maintain desired carbon potential in each zone. This system eliminates the human element in controlling carbon potential. It also provides Warner Gear with the necessary close control required for the practical carburizing of gears with near-eutectoid surface carbon concentrations.

Write for Literature H-54-2.

See the demonstration of the 'Surface' automatic direct-reading carbon potential control system—at the Metal Show in Chicago Nov. 1-5; Booth 714.

Surface
HEAT TREATING EQUIPMENT

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

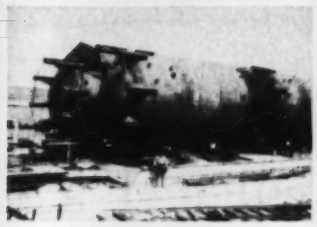
ALSO MAKERS OF

Kathabar HUMIDITY CONDITIONING *Janitrol* AUTOMATIC SPACE HEATING

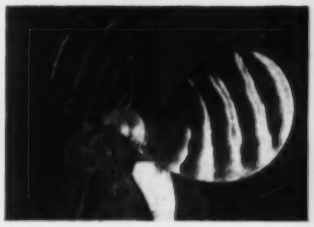
AVONDALE

Now 4 Divisions and

More Steel Than Ever

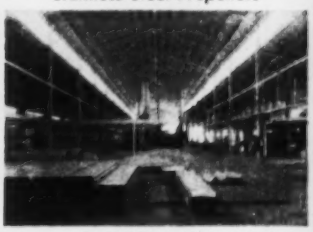


Main Plant—Avondale, La.
Steel Reactor Tanks



Service Foundry—New Orleans, La.
Stainless Steel Propellers

Harvey Plant—Harvey, La.
All types of steel repair



Avoncraft Division—Avondale, La.
Porcelain Enamel on Steel Products

SHIP BUILDING • SHIP REPAIRING • FOUNDERS • PROPELLERS • STRUCTURAL STEEL

STEEL

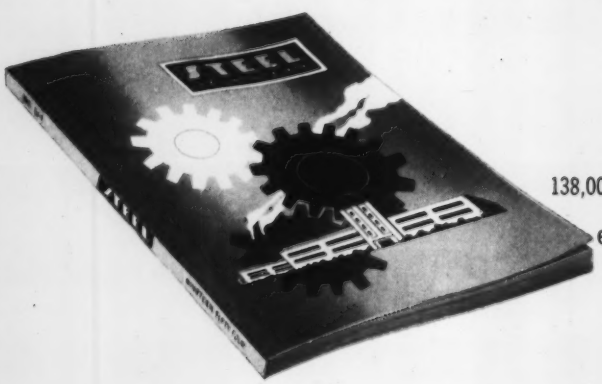
AVONDALE MARINE WAYS, INC. CABLE ADDRESS "AVONWAYS"

P. O. BOX 1030 • PHONE UNiversity 4561 • NEW ORLEANS 8, U. S. A.

To help your salesmen step ahead of competition

Put the strength of STEEL

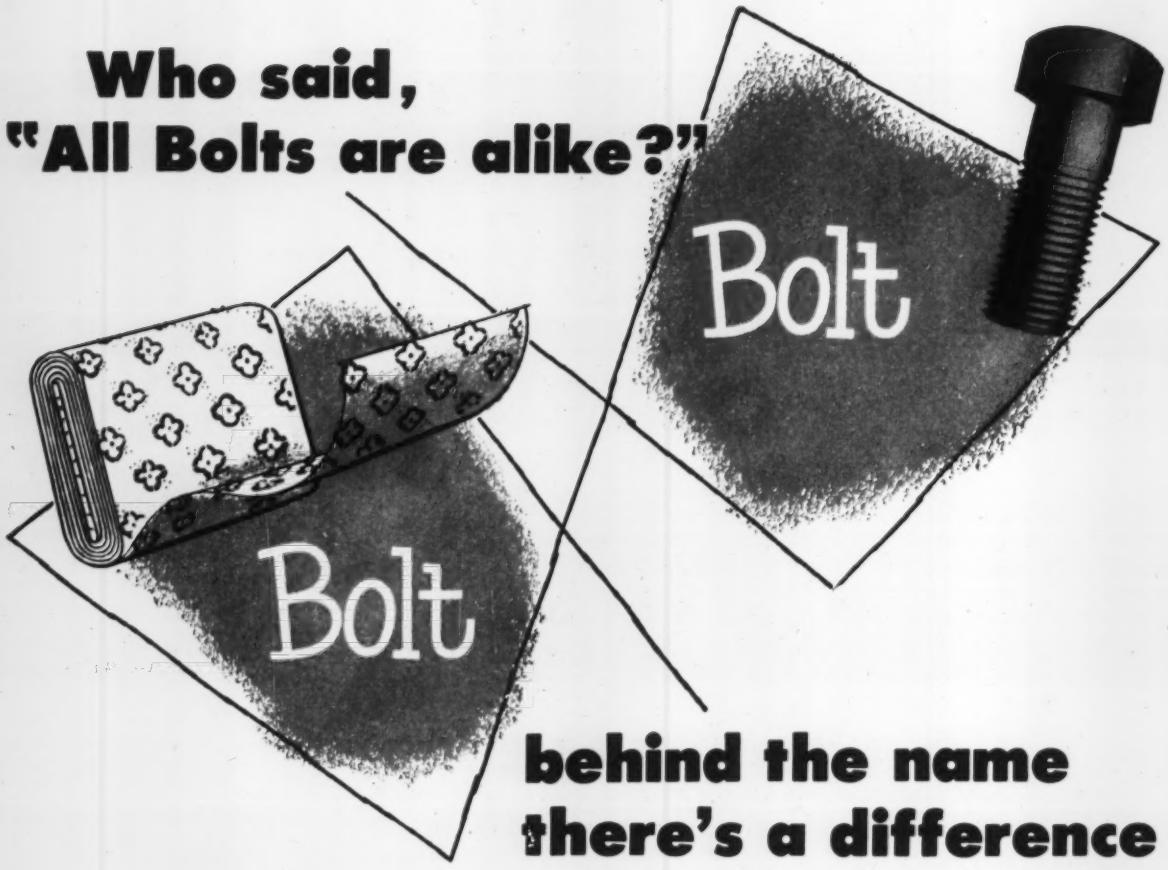
into your



138,000 Management, Production, Engineering and Purchasing executives in metalworking read it . . . use it . . . depend upon it!

advertising program

Who said, "All Bolts are alike?"



behind the name there's a difference

You may have heard the statement "all bolts are alike" so it doesn't matter where you buy them.

Technically, and from a "standards" standpoint, they should be alike. So why is it that some bolt companies like Lamson & Sessions prosper and continue to grow?

Well, we like to think it's because of certain intangible ingredients that can't be measured, tested or even, in some cases, identified.

Maybe their salesmen are more personable, more helpful and agreeable. Or perhaps the service is better with an obvious "all out" effort to satisfy the customer.

Whatever it is, we *do* know that we make every effort to keep our customers smiling. We try to make it *easy* and *pleasant* for them to do business with us.

If that's what it takes to make one bolt a better, more attractive buy than another – fine. We think we're on the right track.

That's why we dare say: "All bolts are *not* alike" and we are happy in the thought that our customers share this opinion.

Lamson & Sessions

The LAMSON & SESSIONS Co.
1971 West 85th St. • Cleveland 2, Ohio
Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

FOR PROMPT DELIVERY AND HELPFUL SERVICE, ORDER FROM YOUR LAMSON DISTRIBUTOR

MACHINE SCREWS — Precision made for fast, economical assembly.

PLUG NUTS — Ideal for blind or hard-to-reach places.

TAPPING SCREWS — Choice of round, pan, truss, flat oval, hexagon and Phillips heads.

CAP SCREWS — "1035" Hi-Tensile Heat-treated steel.

SQUARE AND HEX MACHINE SCREW NUTS — Semi-finished, hot pressed, cold punched.

LOCK NUTS — Economical, vibration proof. Can be used repeatedly.

COTTER PINS — Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS — Cup point type, hardened and heat-treated.

"I was promised delivery today,

but now I'm told you've no stock of one rope and only half enough of another. This delay is costing me money and plenty of it. From now on it's Roebling for me!"

* * *

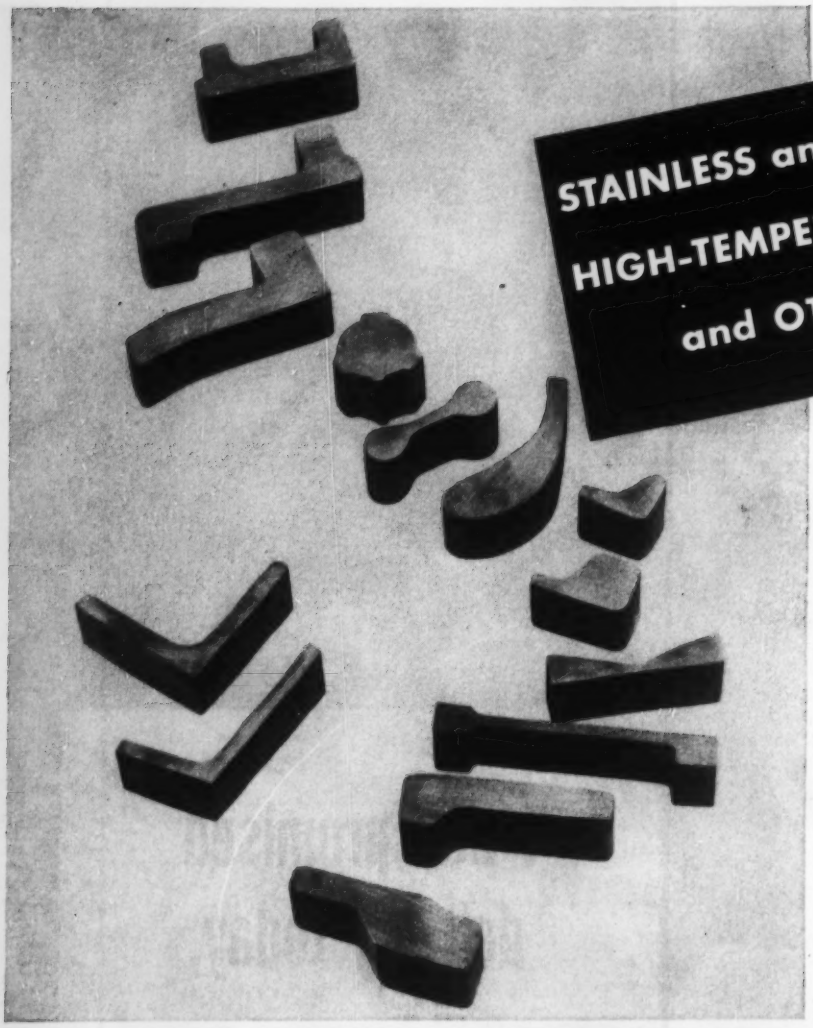
You can count on prompt and full delivery of Roebling wire rope. Your nearest Roebling office and distributor will help you choose the rope that will perform and stand up best in industrial service. And you'll get what you want, when you want it — straight from nearby warehouse stock.

ROEBLING CF

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J.

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.



A-L HOT EXTRUSIONS (solid and hollow) may solve problems for you

Help! (Dept. S-582)

We have a parts problem that hot extrusions might solve. Let's see an AL representative for facts and figures.

- ☐ STAINLESS STEEL
- ☐ TOOL STEEL
- ☐ HIGH TEMPERATURE STEEL
- ☐ OTHER STEELS

Name_____

Company_____

Address_____

Where can these leading advantages of hot-extruded special alloy steels apply to your production?

1. Hot extrusions require very little finishing before use, even in the case of involved shapes. The scrap loss is small and you can buy raw materials closer to finish size. You buy less high-cost steel, cut away less of it . . . save both in time and material cost.

2. The range of shapes, solid or hollow, which can be hot-extruded is almost infinite. They can be easily and quickly produced in any quantity. Dies for new or experimental parts cost little and can be made up fast.

● We're ready to serve your needs with hot extrusions in any grade of stainless or high temperature steel, many tool steel grades and other steels. Call us in to help. ***Allegheny Ludlum Steel Corporation, Oliver Building., Pittsburgh 22, Pennsylvania.***

Leading Producer–High Alloy Steels

Allegheny Ludlum

WAD 9318

AL® TIME-TESTED STAINLESS STEEL

EASTERN TOOL AND STAMPING CO., Inc.

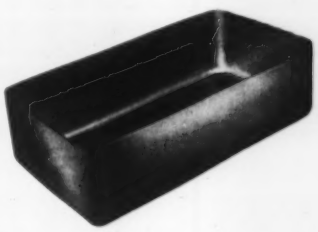
Typical example of 1-piece stamping from 1/8" thick by 7¾" diameter brass blank.

Here is a one-piece stamping that makes up into a hand stapler part.

STAMPING SPECIALISTS IN DEEP DRAWING WORK - ALL METALS - ALL INDUSTRIES

Brass Box—5" deep—14" square—17⅜" Flange.

Spring tempered phosphor bronze contact—note flat foldback feature.



Aluminum Casing—4¾" deep—9⅛" wide—16¾" long.

Steel Machinery Part—7¼" deep—10" dia.

Headlight—6¼" deep—7¾" O.D.

Notice the reduction in this 4⅛" long by ½" O.D. tube with 1⅛" flange.

ETS

EASTERN TOOL AND STAMPING CO., Inc.

PRESSED METAL ENGINEERS
DIES AND STAMPING
110 BALLARD ST., SAUGUS, MASSACHUSETTS

The name Jessop has been synonymous with fine quality steels for 170 years. Jessop metallurgists and production men pioneered many "firsts" in the specialty steel field. For instance, 53 years ago Jessop became the first producer of quality saw steels in the United States. Today, Jessop is making further strides in this field. It is one of very few domestic sources for periphery-rolled saw steel circles and ground and tempered steels for the manufacture of saws. There are several reasons for the consistent high quality of Jessop's saw steels. First of all, Jessop rigidly controls its melting formulas and pours ingots small enough for cross rolling. This assures a fine, uniform grain structure so that the stock blanks well, forms well, swages well, and has superior edge-holding properties. Moreover, though Jessop's tradition dates back to 1784, it is today a young, revitalized organization aggressively building new business on value received. The new Jessop team will give you better service and better delivery than you can expect elsewhere. Send in an order and find out how good this saw steel is.

JESSOP

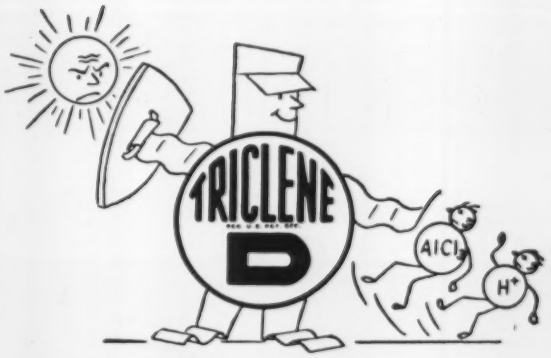
STEEL COMPANY · WASHINGTON, PA.

you get more with

ALL-PURPOSE "TRICLENE"* D

(TRICHLORETHYLENE)

New Du Pont Solvent Is Unsurpassed in Any Vapor Degreasing Job!



EXTRA DURABILITY. With the greatest all-around ruggedness ever built into a trichlorethylene, new "Triclene" D has unsurpassed resistance to heat, light, air, aluminum chloride, acidic materials, and other solvent contaminants. It leaves even the most delicate metal surfaces bright and shiny—free from stain.

EXTRA OPERATING ECONOMY. You get uniform, thorough cleaning with *new* "Triclene" D. Rejects are not a problem . . . work interruptions are cut to a minimum. And *new* "Triclene" D retains its original rugged stability, even after repeated use and distillation.

EXTRA CONVENIENCE. *New* "Triclene" D is an ALL-PURPOSE solvent, built to give you dependable performance in *any* vapor degreasing job. This means you have just *one* brand of solvent to buy and stock—*new* "Triclene" D—for any type degreaser . . . for any class work.

*REG. TRADE-MARK

All these extras add up to the finest solvent ever produced for vapor degreasing by Du Pont, pioneer in the field of synthetic degreasing solvents. Why not get the best solvent your money can buy—all-purpose "Triclene" D! For more details, fill out and mail coupon below.

New All-Purpose

"TRICLENE" D

Trichlorethylene

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . THROUGH CHEMISTRY

SEND FOR THIS NEW DESCRIPTIVE FOLDER

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department, S-10 Wilmington 98, Del.

☐ Please send me your descriptive folder on new, all-purpose "TRICLENE" D.

☐ Please have your representative call with the details.

Name _____ *Position* _____

Firm _____

Address _____

City _____ *State* _____

Machine-Cutting Clears the Way to $13,000 Savings

One steel company is saving up to $13,000 a year by using oxygen shape-cutting machines for making ingot and pan links from steel plate.

Previously these parts were forged at an annual cost of approximately $30,000. The speed and accuracy of oxygen shape-cutting cut costs to $17,000 a year—a savings of more than two dollars on each of the 5,000 parts made.

Machine-cutting setups are speeding fabrication and cutting costs throughout industry. Whatever your part-producing needs are—cutting hundreds of parts at one time, or one-of-a-kind turnout—there are LINDE oxygen shape-cutting machines to help you save hours and dollars in production time.

LINDE service engineers will be glad to help you determine the shape-cutting setup to best serve your job needs. Call your local LINDE representative for more information. Start saving now—call him today.

This lightweight portable cutting machine weighs only 38-lbs., and can cut metals up to 10-in. thick. It can cut straight lines, circles, and plate edge preparations in from 4-in. to 32-in. per minute.

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited, Toronto

Linde Trade-Mark

"Heliarc," "Unionmelt" and "Linde" are registered trade-marks of Union Carbide and Carbon Corporation.

Vanadium-Alloys Steel Company

matchless performance

in Die Steels for Cold Work

better toughness

better grain size control

better control of segregation

and

manufacture by specialists in first quality tool steels

exclusively!

Non-Shrinkable Colonial No. 6

The non-deforming, oil-hardening steel that combines ease of machining with low hardening temperature. Fine performance on blanking dies, punches, gauges, bushings, etc.

Air Hard

5% chromium, air hardening with minimum distortion. Provides toughness and better wear resistance for thread rolling dies, forming and blanking dies, knurls, punches, gauges.

Ohio Die

High carbon, high chromium alloy, air hardening. Affords exceptional resistance to wear, with long life on trimming die, lamination die, shear blade, coining die, roll, mandrel and other difficult assignments.

Crocar

Air or oil hardening. A high carbon, high chromium steel, highly wear resistant; properly selected for lamination dies, wear plates, slitting cutters, forming dies.

Red Star Tungsten

Oil hardening. Unusual edge strength and wear resistance, with high hardness. Specify for taps, punches, spinning tools, slitters, blanking dies.

VANADIUM-ALLOYS STEEL COMPANY

Manufacturers of First Quality Tool and Die Steels

Latrobe, Pennsylvania

COLONIAL STEEL DIVISION • ANCHOR DRAWN STEEL CO.

In Canada:

Vanadium-Alloys Steel Canada Limited, London, Ontario

The efficient action of a Flat Spring is dependent upon the quality of the STRIP STEEL.

WASHBURN

has over 50 years of experience in solving spring steel problems, to guarantee the quality of your product.

Flat Tempered and Untempered Wire in .50 to 1.25 Carbon Range.

Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

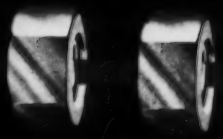
Round Untempered Low and High Carbon Spring Wires.

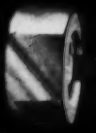
WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

For products you can *count* on

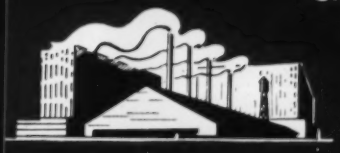




Subtract from your purchasing problems, multiply your efficiency—

Order *all* your metal fastenings from Sterling Bolt where 35 years of service

add up to America's most dependable source . . . for you.



STERLING BOLT COMPANY

General Offices: 363 West Erie Street • Chicago 10, Illinois

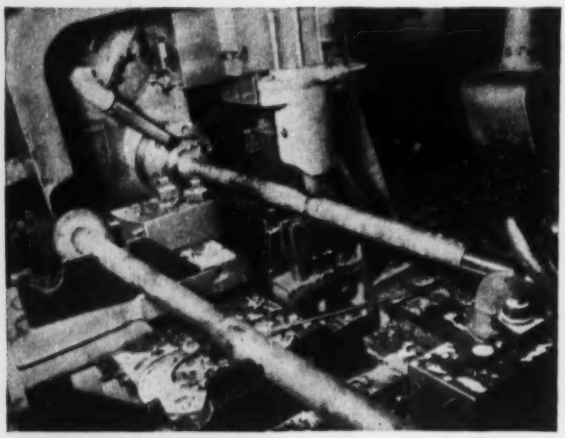
Manufacturing Plants: Chicago • Milwaukee • St. Louis

From on-the-job reports

PRODUCTION INCREASES UP TO 30%

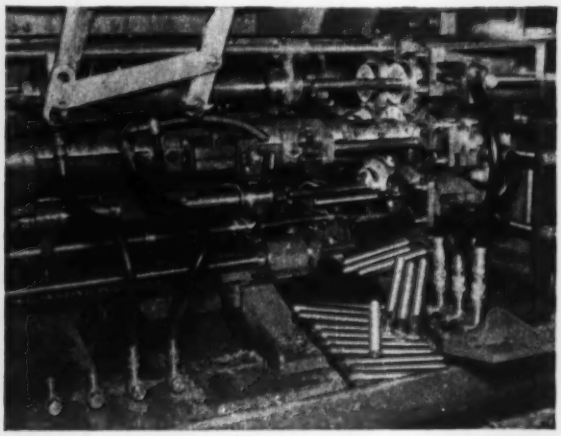
PROPELLER RUNNER. Grade 370 cut machining of tip contours on 165-ton runner from 220 to 65 hours. Carbide takes interrupted cuts through heavy scale at 3 times former speed, with 88% less downtime.

SETUP: Material—Welded high-tensile carbon steel (A 148-50 T, GR 80-50). **Speed**—154 SFPM. **Feed**—½ inch. **Depth of cut**—1/16 inch. **Coolant**—No.



TRUCK AXLE FORGING. Turning with Grade 350 resulted in 33% more pieces per tool. Chipping and flaking, encountered with previously used tools, were eliminated.

SETUP: Material—AISI 4150 steel forging. **Speed**—200 SFPM on 2-inch diameter; 400 SFPM on 4-inch diameter. **Feed**—0.014 inch. **Depth of cut**—1/16 to ⅛ inch. **Coolant**—Yes.



THREADED LEVELING SCREWS. Carboloy Grade 370 tools, used in 6-spindle Cone Automatic, boosted production to 944 screws per hour, compared to 140 with steel tools.

SETUP: Material—SAE B1112 one-inch diameter steel screw stock. **Speed**—1586 RPM for threading. **Feed**—0.005 inch for chamfering and cutoff. **Coolant**—Yes.

WITH NEW CARBOLOY® SERIES 300 STEEL-CUTTING CARBIDES

Case histories prove Grades 350 and 370 outperform, outlast other carbides on tough steel-cutting jobs.

Carboloy Grades 350 and 370 are capable of cutting more cubic inches of steel per minute, with longer tool life, than any other carbides. This has been *proved* on in-the-plant applications, where these grades have boosted production as much as 30% over previous carbides used.

Grade 350 for medium-duty steel cutting, and Grade 370 for heavy-duty steel cutting, are of a new family of carbides, manufactured by an entirely new process.

Both grades have a built-in structural rigidity that enables them to operate at temperatures as high as 1800°F without the tip deformation found in other carbides. They combine superior wear resistance and extreme toughness to a degree never before possible.

Full stocks now available from Authorized Carboloy Distributors

Standard Carboloy Tools are available in Grades 350 and 370. In addition, blanks and inserts of each grade are available in a wide range of styles and sizes.

Carbides for *any* machining job. Regardless of your particular machining problem, a grade of Carboloy cemented carbide is available to handle it. Over a quarter century of experience in machining ferrous and nonferrous, metallic and nonmetallic materials has been acquired by the Carboloy organization. See your Authorized Carboloy Distributor or Carboloy salesman for qualified, expert machining assistance.

CARBOLOY
DEPARTMENT OF GENERAL ELECTRIC COMPANY

"Carboloy" is the trademark for products of the Carboloy Department of General Electric Company

Carboloy
Department of General Electric Company
11141 East 8 Mile Ave., Detroit 32, Michigan

Send new Price List GT-300, containing specifications and prices on new Grades 350 and 370.

Name _____ Position _____

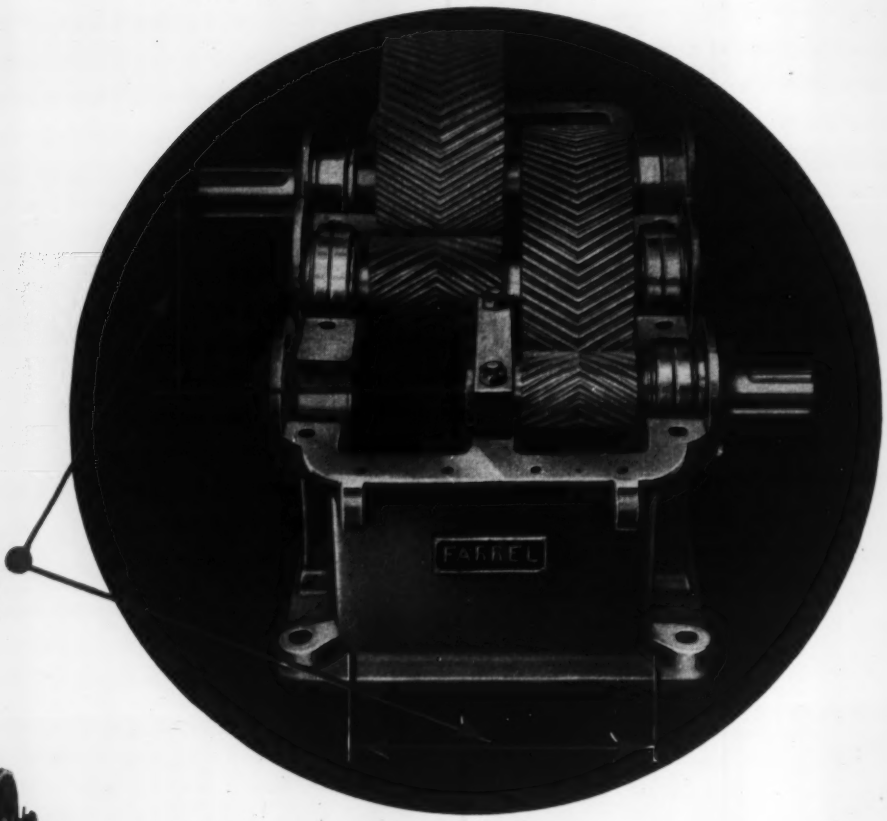
Company _____

Address _____

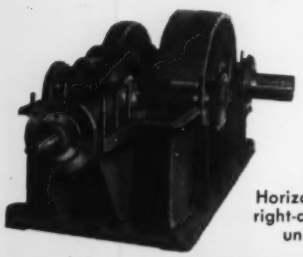
City _____ Zone _____ State _____

A special talent

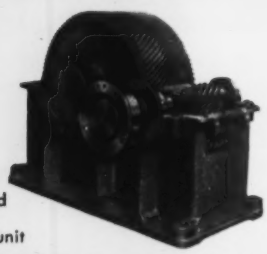
makes this the right speed reducer for the job



Relation of center distance and width of case gives latitude in proportioning gears to specific conditions.



Horizontal right-angle unit



Standard single reduction unit

The design of a Farrel® speed reducer is flexible. Its adaptability in critical detail gives it advantages over "standardized" units which result in the solution of innumerable application problems. You can ask for—and get—a unit that will fit your requirements exactly.

The gears and pinions can be proportioned to meet specific load, speed and service requirements. Input and output shafts can be varied in size, in material, and in extension. Even some housing dimensions can be modified to meet problems in mounting.

Remember too, that the gearing in a Farrel speed reducer has teeth generated by the famous Farrel-Sykes method—a process that assures accuracy of tooth spacing, profile and helix angle. The herringbone design provides evenly distributed pressure over each tooth, from tip to working depth line. This means that there is no tendency for the teeth to wear unevenly, and thus shorten the life of the gears.

Farrel speed reducers are made in a number of types, with a wide range of ratios and capacities. For more about these adaptable units, write for a copy of bulletin 449.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Akron, Detroit, Chicago, Memphis, Minneapolis, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

FB-880

Farrel-Birmingham®

Introducing

NICKEL-LUME

FOR BRIGHT NICKEL BARREL PLATING

H-VW-M takes great pleasure in introducing the Nickel-Lume Barrel Plating Process, ideal for producing bright-from-the-barrel decorative nickel coatings on small automotive parts, jewelry, novelties, nail clippers, files, hardware, fasteners, screws, and similar items. The new process is an application of Nickel-Lume, which made its appearance a year ago as an outstanding development in a bright nickel for rack plating.

Barrel installations have been in operation in the field for some time with many enthusiastic users. An important feature of this bright-nickel barrel process, is the consistency of color maintained even in recessed areas, as in hard-to-plate threaded parts. Subsequent chromium plating can be handled with ease since the nickel deposit is very active and, unlike many bright barrel processes, is not brittle.

Advantages of Nickel-Lume Barrel Plating are:

Uniform Brightness—deposits, right out of the barrel, are uniformly bright with a pleasing "clean," white color even in hard-to-plate areas.

Low Stress—deposits are ductile and have a low compressive or tensile internal stress.

Activation Not Required—no activation is required between the nickel and chromium or other subsequent deposits.

High Tolerance To Impurities—organics are tolerated in greater concentrations than in other bright baths.

Complete Control—complete analytical control of all constituents.

Wide Operating Range—current density and temperature have a wide range with no resultant loss of brightness.

Good Corrosion Resistance—nature of the addition agent plus constant deposit characteristics give a high level of protection to the plated surface.

Stability—not a "fussy" bath—remarkably stable over long periods of operation.

Nickel-Lume for Barrel Plating is the direct result of continuous research conducted at H-VW-M . . . another example of Platemanship in action. Complete details and a new instruction manual will be forwarded on request.

PLATEMANSHIP

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing — of a complete equipment, process and supply line for every need.

HANSON-VAN WINKLE-MUNNING CO., MATAWAN, N. J.
Plants: **Matawan, N. J. • Anderson, Ind. • Grand Rapids, Mich.**
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H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

...for the
continuous

casting of steel

Koppers builds the first commercial-scale machine

THE continuous-casting machine, illustrated here, is now in operation at Atlas Steels Ltd., Welland, Ontario, Canada. This is the first commercial-scale installation in North America that, in a continuous line, converts molten steel into solidified billets or slabs. It was designed and constructed by the Freyn Department of Koppers Engineering and Construction Division.

Atlas Steels' machine is presently producing slabs and billets in three sizes. With different molds, this machine also could produce any desired billet section. It is designed to cast 35-ton heats.

In theory, this new machine could cast a billet or slab of steel many miles in length; it is limited only by the supply of molten metal. In actual practice, acetylene torches automatically cut the molded steel into required lengths as it emerges from the machine.

Continuous casting is an *economical* short-cut in steelmaking. As shown in the "Comparison Chart," the continuous-casting operation can eliminate many laborious and costly steps. Furthermore, the Freyn-design continuous-casting process can yield 10 to 15 per cent more finished steel per heat than conventional pouring methods.

Your inquiry is invited concerning the continuous-casting operation . . . or any other metallurgical construction problems you may have. You incur no obligation, of course.

Designing and constructing continuous-casting machines is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers.

POTENTIAL SAVINGS

Conventional Casting	Continuous Casting
MELTING FURNACE	MELTING FURNACE
LADLE	LADLE
CRANE TRANSPORT TO POURING PLATFORM	CRANE TRANSPORT TO CONTINUOUS-CASTING MACHINE
INGOT MOLDS	CONTINUOUS-CASTING MACHINE
RAIL TRANSPORT TO STRIPPER	SEMI-FINISHED PRODUCT
STRIPPER	
RAIL TRANSPORT TO SOAKING PIT BUILDING	
CRANE TRANSPORT TO SOAKING PIT	
SOAKING PIT	
CRANE TRANSPORT TO BLOOMING MILL	
BLOOMING MILL	
SEMI-FINISHED PRODUCT	

KOPPERS®

Engineering and Construction Division

Freyn Department

KOPPERS COMPANY, INC., PITTSBURGH 19, PENNSYLVANIA

. . . things to watch for when buying Philodendron

But if you're buying special purpose STEELS, may we recommend the SPEED STEELS

SPEED CASE — a low carbon free machining open hearth steel

SPEED TREAT — a medium carbon free machining open hearth steel

SPEED ALLOY — a chromium alloy steel

briefly they ✓ are easy to heat-treat ✓ are fast machining ✓ give longer tool life ✓ produce better finishes

THERE ARE SPEED STEEL SPECIALISTS IN...

☐ Akron, Ohio	Burger Iron Co.
☐ Bridgeport, Conn.	Bridgeport Steel Co.
☐ Buffalo, N. Y.	Beals, McCarthy & Rogers
☐ Cambridge (Boston), Mass.	Brown Wales Co.
☐ Chicago, Ill.	W. J. Holliday & Co., Inc.
☐ Dallas, Tex.	Earle M. Jorgensen Co.
☐ Detroit, Mich.	Peninsular Steel Co.
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☐ Houston, Tex.	Earle M. Jorgensen Co.
☐ Indianapolis, Ind.	W. J. Holliday & Co., Inc.
☐ Lewistown, Me.	Brown Wales Co.
☐ Los Angeles, Calif.	Earle M. Jorgensen Co.
☐ Memphis, Tenn.	Pidgeon-Thomas Iron Co.
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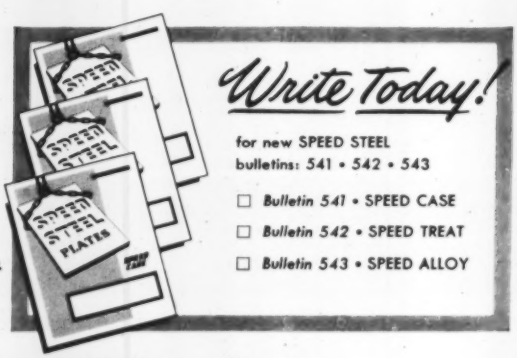
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SPEED STEEL
SPEED STEEL PLATES
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for new SPEED STEEL bulletins: 541 • 542 • 543
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☐ Bulletin 542 • SPEED TREAT
☐ Bulletin 543 • SPEED ALLOY

W. J. Holliday & Co., Inc.

141 141st STREET • HAMMOND, INDIANA

Speed steels are produced by W. J. Holliday & Co., Inc., Speed Steel Plate Division

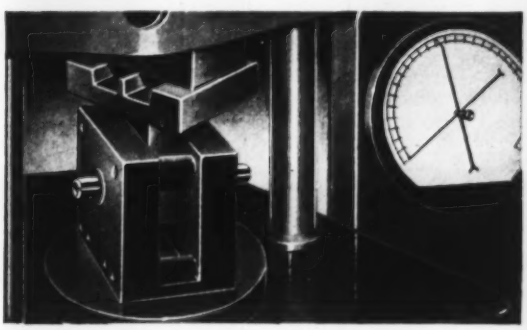
Normal leverage puts the load on the pins at these points. Pins must have a high resistance to shearing — and every pin must stand up to plenty of abuse. Many manufacturers' tests have proved Rollpin's uniformly high shear strength.

consistent strength... as important in the pin as in the socket

The Moore Drop Forging Company, who manufactures the famous Craftsman wrenches for Sears Roebuck and Co., used stainless steel rivets to fasten the universal joint on their Flex sockets. Thorough testing, under all possible load conditions and drive angles, convinced them that Rollpin was stronger than the stainless steel rivet previously used. This led to a redesign of the joint with Rollpins replacing the rivets. Also, the spring tension inherent in the Rollpin locking principle was used to provide the "drag" that holds the socket head in angular position. The result . . . an improved product at lower cost.

Dependability like this is based on the rigid ESNA® quality controls that insure consistent strength and mean reliable performance by every Rollpin.

Moore Drop Forging Company was able to save assembly time, too. Rollpin is simply driven into holes drilled to normal production tolerances. It compresses as driven, locking itself in place by exerting pressure on the hole walls. In this case, the extra operation of spinning on a rivet head was eliminated.



We urge you to test spring pins before you buy — for uniformity of diameter and length, hardness, insertion and removal forces, and recovery of diameter, as well as shear strength.

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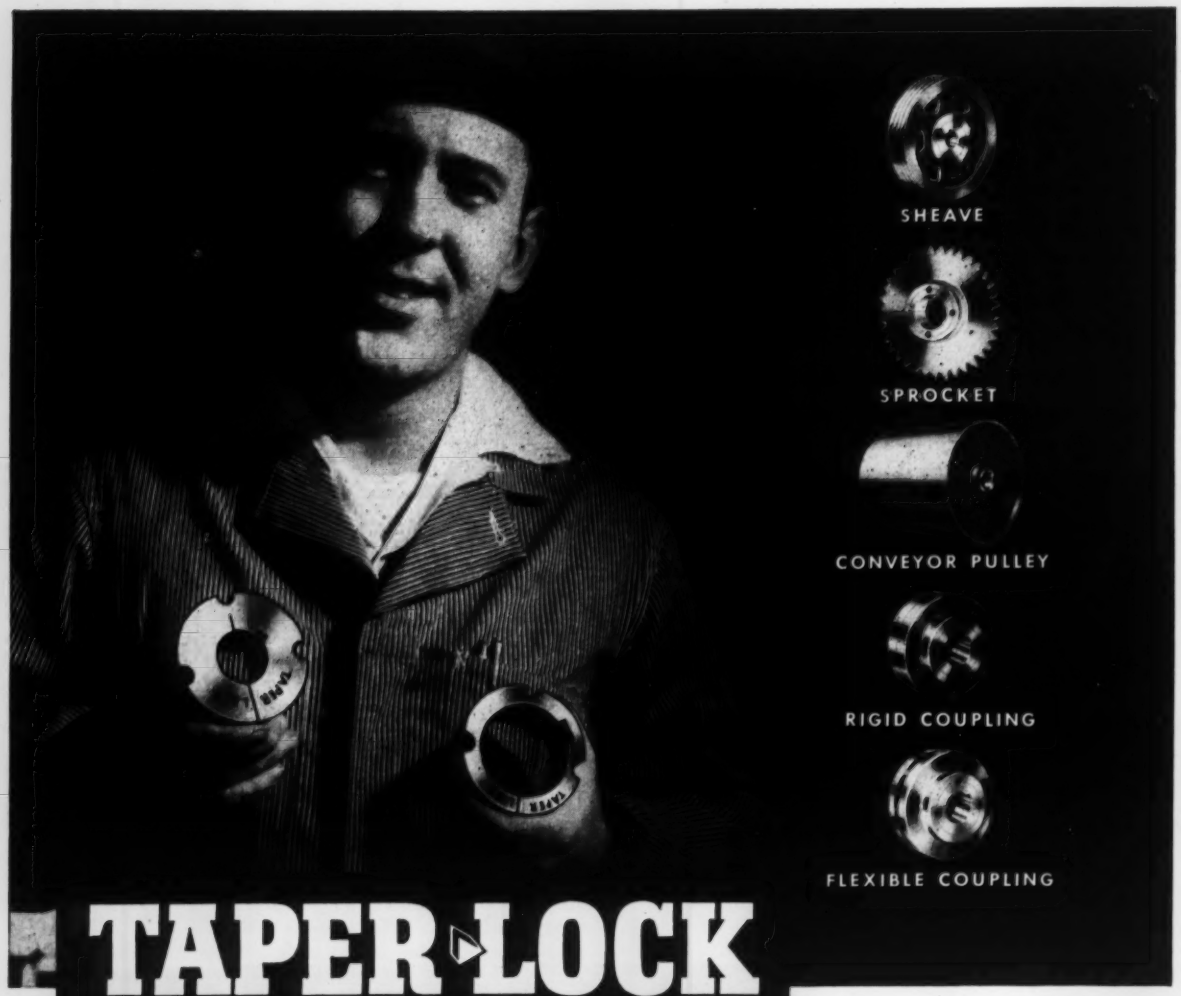

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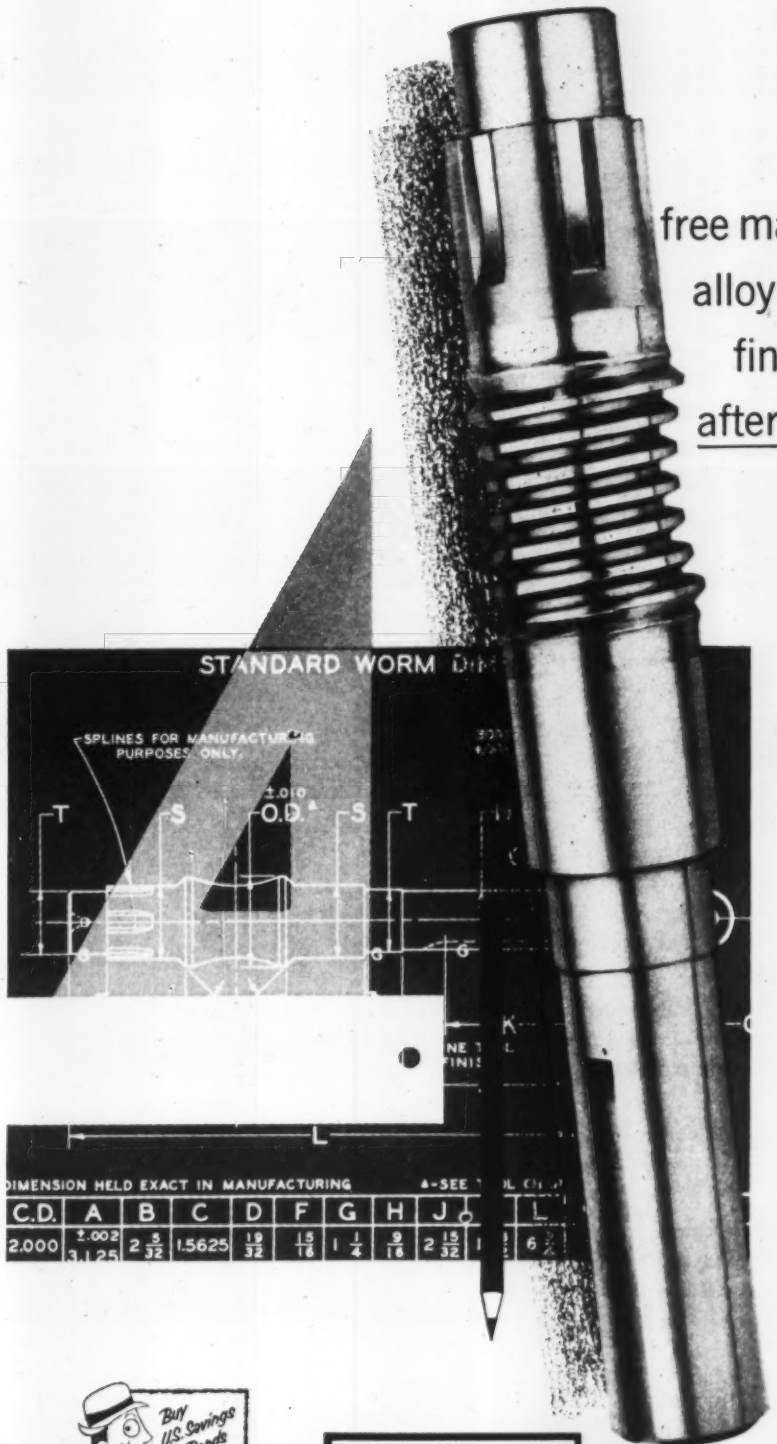

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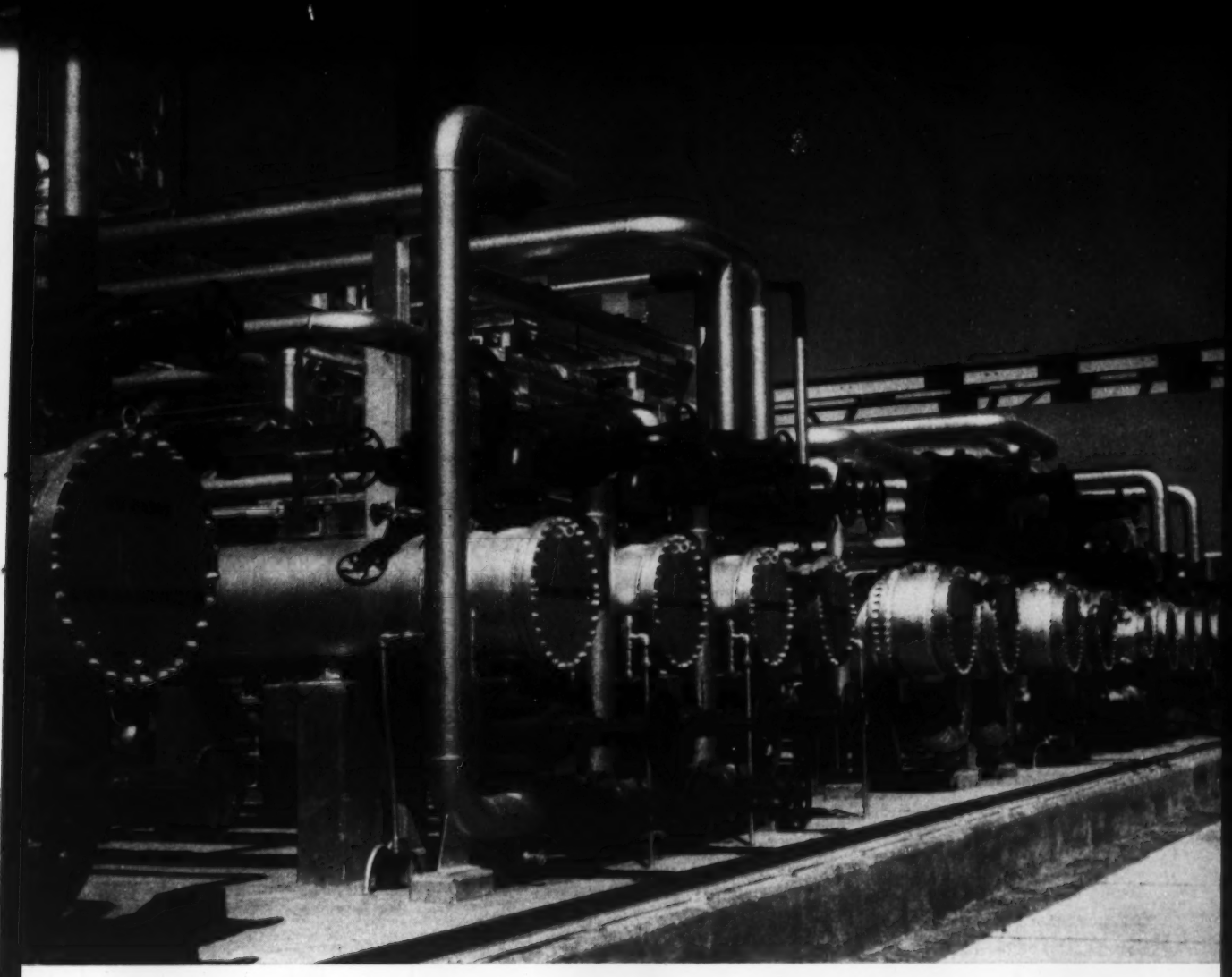

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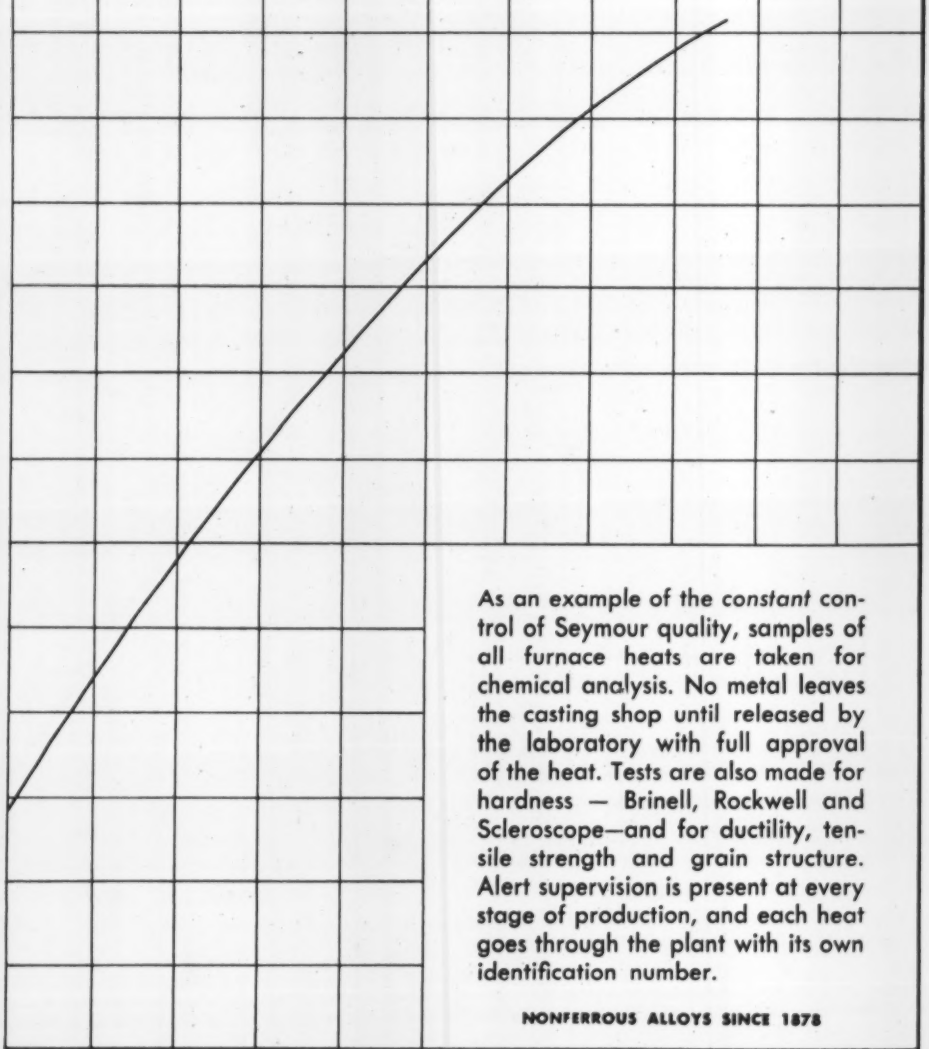

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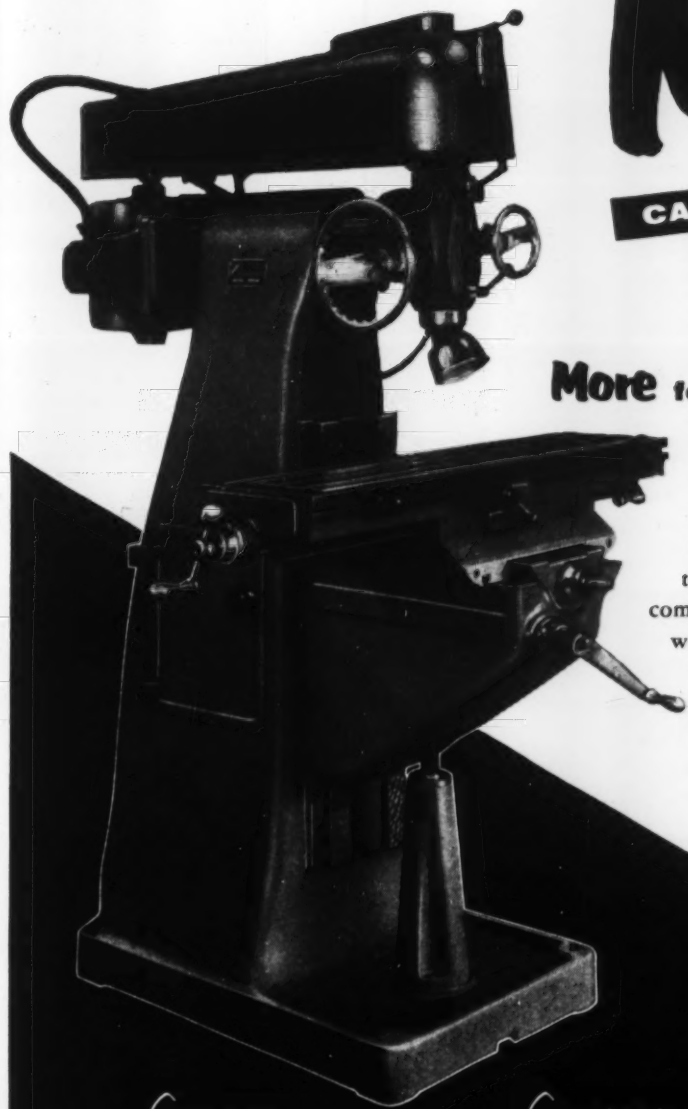

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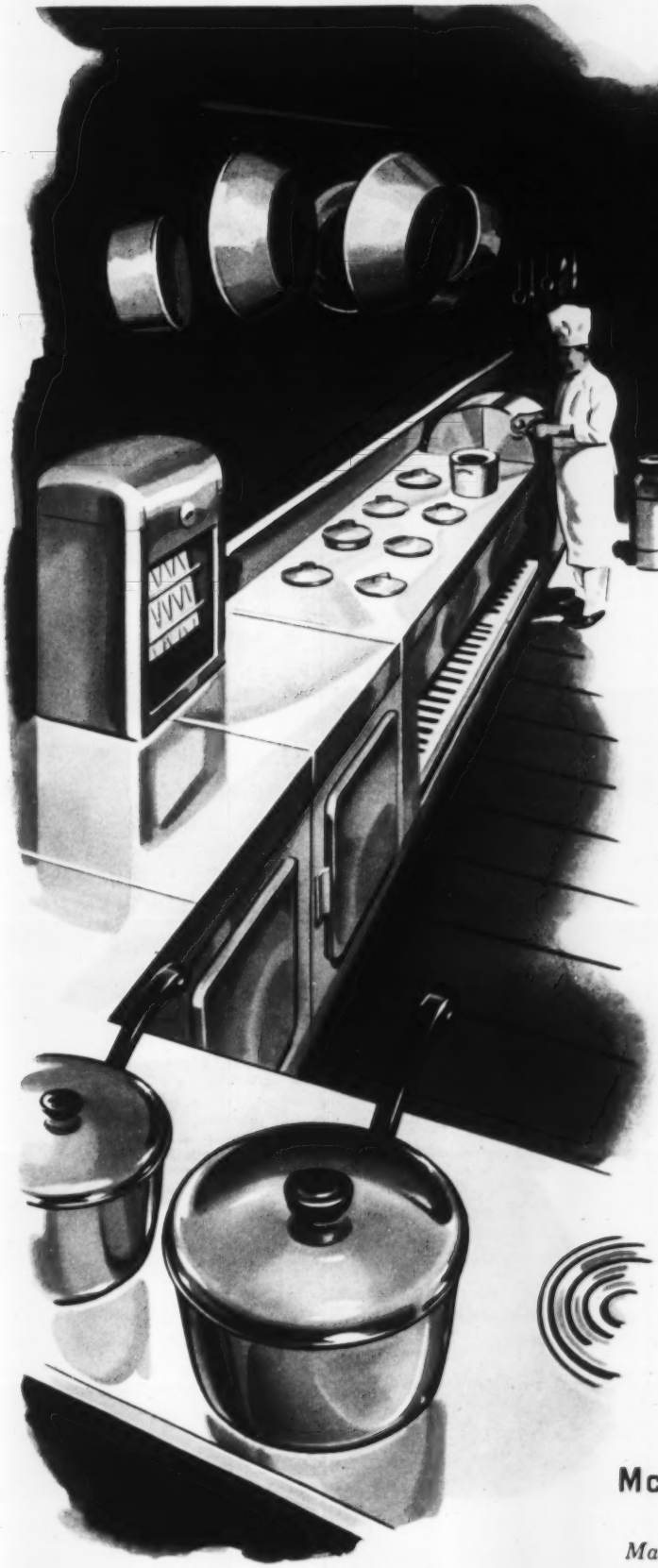

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October 25, 1954

Metalworking Outlook

The Engagement Is Announced

The chances for merger of AFL and CIO are the brightest in years. But the engagement is just being announced, and a lot can happen before the marriage occurs. Omens for merger: First test of the AFL-CIO no-raid pact, in the meat packing industry, was accepted peacefully by the losing union; a joint committee of both big organizations is studying merger steps; top officials in both are publicly supporting merger; the political line of both is identical. Omens against: AFL and CIO inner organizations and philosophies differ; there's no complete agreement on who would head the new union; John L. Lewis is not included, and he could throw a wrench into nuptial plans.

No Wage-Cut Trend

When Studebaker and Willys United Auto Worker locals earlier this year agreed to wage cuts, some observers thought a trend was starting. Not so. In two new cases, unions have refused to take pay reductions. New York Shipbuilding Corp. finally had to give a 5-cent boost to all in its AFL boilermakers local except a few high paid welders. Detroit Gear Division of Borg-Warner Corp. asked for a 15 per cent incentive pay cut and the voluntary surrender by 500 employees of a 5-cent production raise due at the end of October. As of last week, the UAW local was still saying no.

Richfield To Fight NLRB Ruling

The far-reaching NLRB decision last week makes employee stock purchase plans a bargainable issue in union negotiations. In a 3-to-1 decision, NLRB went beyond the Inland Steel decision of 1948 in which pensions were declared bargainable. The case involved CIO oil workers and Richfield Oil Corp. Richfield will appeal. Employee stock purchase plans in effect last year covered 1 million employees in 33 corporations.

Those Amazing Houses

In the first nine months, 906,500 new houses were started, some 5 per cent more than in the figure for the first three quarters of 1953. Experts attribute the gain mainly to liberalized mortgage loan provisions of the Housing Act, and to the ready availability of mortgage money on easy terms. Federal Housing Administration in September had more mortgage loan applications than in any September in its history.

Minerals Rush, 1954 Style

Watch for increased exploration in the U.S. for strategic and critical minerals. Prices on most of them encourage the activity; the government's aid helps, too. Defense Minerals Exploration Administration has assisted financially in activities that have uncovered minerals valued at $160 mil-

Market Outlook—p. 235

lion, of which $8.5 million has already been delivered to and paid for by the U.S. The minerals sought include tungsten, nickel, germanium, mica, lead, zinc, tantalum, manganese, fluorspar and thorium.

High-Flying Industry

Look for continued high-flying activity in aircraft. The Air Force has placed $1.2 billion in contracts since July 1, more than $1 billion of that in the last seven weeks. Some 61,000 U.S. companies today get the major part of their income from aircraft business. The industry employs 823,000.

Fourth-Quarter Profits

Early steel company earnings reports indicate a fourth-quarter pickup in profits. The third quarter looks to be the low point of the year. Republic Steel Corp.'s net income for July, August and September was $10.3 million, compared with $14 million for the same period of 1953. Allegheny Ludlum Steel Corp. net profits hit $546,886 for the 1954 quarter, compared to $2 million for the same 1953 months.

Where the Atom Helps Industry

Atomic energy has created an industry with sales of $35 million and employment of 2800 to supply capital goods to users of atomic energy. Council for Technological Advancement, an affiliate of Machinery & Allied Products Institute, reports that 10 per cent of the respondents to its survey hold prime contracts with the Atomic Energy Commission and 22 per cent hold subs with AEC primes. Some 8 per cent of the respondents use industrial applications of radioisotopes. CTA takes a more optimistic view about atomic opportunities for industry than do some industrialists (p. 96).

Straws in the Wind

Scott-Atwater Mfg. Co. predicts there may be a boat for one family in three in the U.S. by 1964 . . . Mosler Safe Co. predicts a boom year in 1955 for makers of bank equipment . . . The Labor department is launching a survey of the $2.5 billion research and development program of American industry . . . C.I.T. Corp. will offer terms on capital equipment geared to take advantage of the new depreciation schedules in the tax law . . . Small household appliances using the sun's energy will be in fairly widespread use within the next five years, especially in tropical regions, says Dr. Maria Telkes of New York University's College of Engineering.

This Week in Metalworking

Odds are good for production of 93 million tons of steel ingots in 1955 (p. 91) . . . Westinghouse Electric Corp. sees good business ahead in a survey through 1957 (p. 92) . . . Truck shipping costs can be cut (p. 94) . . . Defense department has plans to buy $100 million worth of machine tools and other equipment for defense production (p. 97) . . . West Europe's steel capacity has gained far less than that of the U.S. or Russia (p. 101) . . . How to go about buying or selling a company (p. 102).

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Nine-Year Comeback

Several weeks ago in London, representatives of nine western nations drafted the broad outline of a West European Union. On Oct. 12, the French National Assembly gave Premier Mendes-France a resounding 350 to 113 vote of confidence, based largely upon approval of his stand at the London conference. There remain formidable obstacles to be overcome, including a settlement of the difficult Saar basin dispute, but there is definite hope that WEU may become a reality.

If and when this occurs, West Germany will assume a new role in world affairs. Already her record is phenomenal. As a result of the unfortunate and inexcusable division of Germany in 1945, West Germany consists of the American, British and French zones, which, fortunately, operate effectively as a single unit. She has an area of just under 100,000 square miles—about the size of Oregon or Wyoming. Her population is slightly under 50 million, which is roughly comparable to that of the United Kingdom or of Brazil.

More important than the physical factors of area and population are West Germany's recent accomplishments. Since the end of World War II, she has been forced to absorb more than 10 million expellees and refugees from Russia and satellite countries behind the iron curtain. She has had to rebuild homes, plants and facilities destroyed during the war. In spite of these hardships she is producing almost twice as much as she was before the war. Also, her per capita output for steel ranks third in the world, being exceeded only by that of the United States and the United Kingdom.

Emergence of West Germany as an independent nation will bring about startling developments. Organizing, equipping and supplying an army of half a million troops will provide additional support to the country's already flourishing economy. It will push West Germany more actively into free world markets for the purchase of raw materials, components, equipment and even ordnance.

In short, independent West Germany is destined to play a more dominant roll in affairs of the western world than occupied West Germany ever could.

E. C. Shaner

EDITOR-IN-CHIEF

PATTERN FOR PROFIT: At this writing it looks as if the 1954 National Metal Congress and Exposition at Chicago Nov. 1-5 may establish new records in interest, attendance and value. Certainly many years of experience prove convincingly that the American Society

for Metals, sponsors of this annual event, and co-operating technical societies always strive hard to make each year's meetings and show better than those of preceding years.

This year there is an additional reason why the exhibits and technical sessions may excel earlier ones. For the first time in many years, the supply of most industrial products exceeds demand by substantial margins. Competition between many materials, processes, products, companies and industrial groups is keener than it has been in nearly two decades.

Next week's congress and show should act as a special magnet to draw industrial executives to Chicago for the purpose of soaking up fresh ideas with which to combat intense competition. Indeed, it affords an unusual opportunity to gain new information (p. 133) upon which to establish a better "pattern for profit."

WATER PROBLEM ACUTE: That more and more attention is being given to the problem of water pollution by American industry is a good sign. The rapid growth of industrial plants during the last decade has multiplied many-fold the importance of the dual factors of volume and purity of water.

It is estimated that in the United States (p. 93) industry is spending about $2 million annually on research on pollution of water. Also, it is estimated that industry has about $1 billion invested in facilities having to do with the problems of water pollution. In the light of past experience these figures seem to be impressive, but to those persons who have been studying the water situation objectively, they are grossly inadequate.

Every metalworking company that discharges industrial wastes or uses water in substantial volume should be prepared to spend more money for water purification and conservation. It is one of industry's major problems.

LET'S CLEAR THE AIR! Pollution of air is becoming almost as obnoxious as pollution of water. Los Angeles is going through another siege of smog—a contamination of the atmosphere by irritants whose sources have not been established conclusively. Meanwhile, in the newspapers of almost every industrial area, one reads of queer cases where somebody's freshly painted white house has turned to a sickly off-color overnight.

In most cases the nearest industrial plant becomes the No. 1 suspect almost immediately. Sometimes it is guilty and sometimes it is innocent. The lamentable fact is that we do not know enough about contamination of air. We have much to learn about the effects of wastes that pass from industrial stacks into the atmosphere.

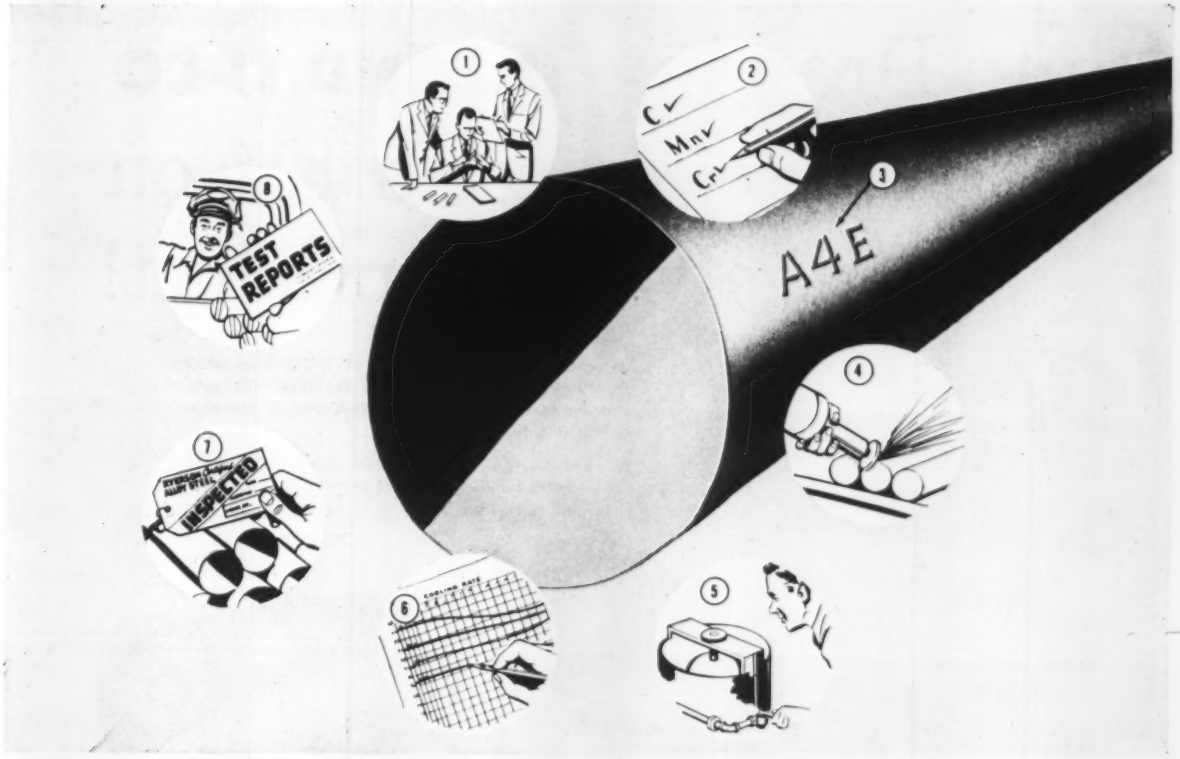
Three remedial measures are suggested: 1. Intensify research on all aspects of air pollution. 2. Build all new potential air-contaminating industries remote from residential areas. 3. Press for more effective air-cleaning equipment.

REALISM IN STATISTICS: Much printers' ink has been consumed informing Americans of the economic impact of the larger-than-expected birth rate in recent years. Washington statisticians have been enjoying a field day in translating the boom of baby boys and girls (p. 95) into terms of consumption of the things these babies use and need.

Of course, the greater number of babies born annually has increased the consumption of these items, but not to the extent the statisticians expected. Why? Because parents today are rearing families of three, four, five or six or more children, while their parents were content with two or three children. The one crib or stroller today will do service for six or seven children as well as it did for two or three a generation ago.

Don't let these trick statistics fool you!

CATCHING UP: Tail end of the rolling adjustment from a wartime to peacetime economy is believed here. The leveling-off this year found metalworking with a large steel inventory. Result: Steelmakers' operations dropped lower than most other segments. But inventories are now coming into balance, and 1955 business generally is expected to match this year's pace. That means the same amount of steel will be consumed next year as this. Without the large inventory to draw upon, steel ingot output (p. 91) will have to be increased 7 per cent to meet the demand. It'll give the steelmakers an opportunity to catch up businesswise with the rest of the economy.



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First, to assure you alloys of highest quality, we carefully select each heat to be carried in Ryerson stock [1]—verify the analysis as soon as a heat is received. [2] Next, for permanent identification, we stamp each bar with its particular heat symbol [3]—color mark it according to type. Then, to guard against mixed steels, we spark test every lift of bars from each heat. [4]

Meanwhile, we test a sample of every heat for hardenability [5] and interpret the test results for you. [6] So, finally, when you call Ryerson for alloys you can be sure. Tested steel—racked separately by heats—is prepared to your order; given a final inspection [7] and rushed to your plant. And with your steel (as-rolled or annealed), you receive complete test data [8] to verify quality and guide heat treatment.

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Principal Products: Carbon, Alloy & Stainless Steels—Bars, Structurals, Plates, Sheets, Tubing, Machinery & Tools, Etc.

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JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
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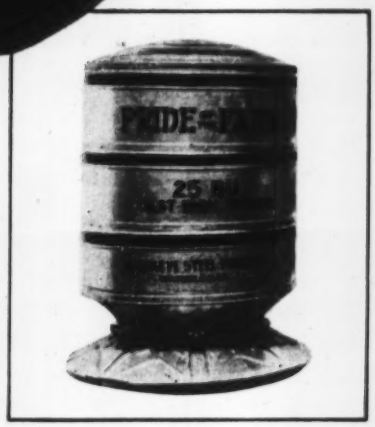
Spin-Drawing **INLAND TI-CO®** cuts production costs 40% on galvanized product!

Sequence photos shows 1. disc of TI-CO from which waterer tank is spin-drawn, 2. the tank with spin-drawing operation half completed, and 3. the completed tank, fully drawn.

Whether your galvanized products require spin-drawing, stamping, bending, crimping or lock-seaming, Inland TI-CO will make them better and longer lasting.

HAWKEYE STEEL PRODUCTS, INC. PIONEERS SPIN-DRAWING OF GALVANIZED SHEETS ON COMMERCIAL BASIS

For years, Hawkeye Steel Products, Inc., Waterloo, Iowa, manufactured the tank of their famous "Pride of the Farm" hog waterer with straight sides, soldered at the joints. Spin-drawing was out of the question. There wasn't a pot-dipped galvanized sheet available that could withstand this operation without excessive flaking of the zinc coating. Then Hawkeye learned about Inland's new continuous process galvanized sheet, TI-CO, the sheet with a zinc coating that won't flake. They decided to try it on spin-drawing. A special machine was designed and built for the operation by Hawkeye engineers. First results were so successful that today Hawkeye spin-draws all covers and cones for their waterer tanks from Inland TI-CO, with a resultant reduction in production costs of 40% (a reduction in soldering of 30% alone) and a finished product that is greatly improved in appearance and durability.



Get the whole story *on how TI-CO can help you produce better galvanized products for less—and turn out new products not practical with ordinary galvanized sheets. Write today for new TI-CO catalog.*

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INLAND TI-CO®

. . . with the zinc coating that rolls with the punch.

Next Year—7% More Steel

	MILLION INGOT TONS
1955	93*
1954	87*
1953	112.3
1952	93.1
1951	105.2
1950	96.8

*Estimated by STEEL

Henry J. Kaiser Co.

Steel Output: 75% of Capacity in 1955

Will increase to that figure because the inventory adjustment is nearly complete. Steel consumption next year will hold at this year's level

STEELMAKERS' records a year from now may show an enviable 7-per-cent increase over 1954. Operations in 1955 should average 75 per cent of capacity.

The 75 per cent figure doesn't sound too vigorous, but it's misleading. It will amount to over 93 million tons of steel for ingots and castings, which add up to the fourth or fifth highest production year in the industry's history (see chart).

Catching Up—The steelmaking increase, however, won't reflect general metalworking business. It'll represent a catching-up process of steel production with consumption.

This is the time of year market research personnel sharpen their forecasting pencils to plan company operations for the coming year. For steelmakers harried all year with "inventory adjustment" —the most-used metalworking term of '54—the outlook is good.

Use — Some 6 million tons of finished — from 8 or 9 million tons of ingots — were consumed from inventory this year. Add that to the 87 million expected to be produced this year and consumption is approximating 96 or 97 million tons, equivalent to about a 78-per-cent ingot rate if there had been no steel inventories.

Key Factors—Here are some of the factors the steel planners are looking at:

Construction, one of the mainstays of the steel industry this year, shows promise of another big year ahead.

The railroads, who completely dropped out of the steel market this year by living off inventories, will have to come back into the market in 1955, even if their business remains at its low level.

The auto industry, already creating longer delivery schedules with its pickup in demand, is preparing for a year at least as good as 1954.

Capital equipment indexes have shown an upturn from their long decline and should maintain production in 1955 above this year's level.

The container industry boosted the amount of steel it consumes to over 10 per cent of total steel output this year and its prospects continue good.

A Breather—As Max D. Howell, executive vice president of American Iron & Steel Institute, said at AISI's regional meeting in Pittsburgh: "The country is catching its breath for a new economic advance."

Future Looks Good to Westinghouse

Company experts foresee continued high consumer spending. Plans made through 1957 include the building of $3 million worth of new facilities

BY 1957, Westinghouse Electric Co. plans to beef up its share of three markets. Gwilym A. Price, president, hopes to capture 75 per cent more of the consumer market, 15 per cent more of the heavy equipment market and 30 per cent more of the general industrial market.

Analyzing Westinghouse's product structure in a speech before the New York Society of Security Analysts, he pointed out that such consumer products as major and small appliances, TV sets, radios and lamps account for about 26 per cent of the company's sales volume. Heavy equipment and general industrial products amount to 60 per cent and defense products make up the other 14.

Basis for Planning — Five-year forecasts, formulated by a business projections committee, are used by Westinghouse as its basis for planning. The last survey, covering 1952 through 1957, predicted that consumer spending would hold steady and high. So plans have been concentrated around expansion of production facilities, research, engineering and new product development.

Some $3 million worth of new facilities will be completed by mid-1955. Promotion and advertising are being stepped up. Sales and dealer organizations are being revamped. A consumer credit plan to encourage sales in rural areas is being established.

Consumer Dollars—A new plant is being built at Staunton, Va., to make home air-conditioning and heating units. Westinghouse experts predict that 500,000 color TV sets will be made in 1955, with the $500 set to come two or three years later. Appliances, including dishwashers, garbage disposals and automatic laundries, are also seen as having good growth potential.

Mr. Price predicted that continued high level investment would be made in plant equipment, with highly automatic machinery reducing the labor content of both assembly-type operations and job-shop work.

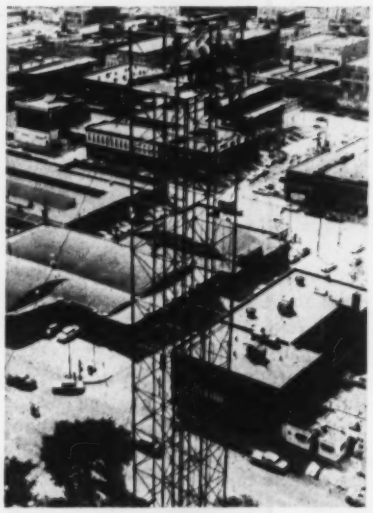
More Predictions—Other predictions of the projections committee were that the total market for heavy equipment, such as generator plants, would show an average increase of 6½ per cent per year. General industrial products, comprising such items as wiring devices, fractional horsepower motors and specialized items like elevators and electric stairways, were set at a yearly increase of 8½ per cent. The company plans to expand its share of the market in these lines by 15 and 30 per cent, respectively, by 1957.

Defense business, Mr. Price said, was obviously harder to formulate. Rating it as accounting for about 14 per cent of Westinghouse's total billings, he thought that it would increase in 1955 and 1956 from 1954.

Atomic Energy — He remarked that the practical industrial application of atomic energy already represents a substantial dollar volume. The near-term market, according to company experts, is in naval propulsion equipment. More than 3500 companies were involved in building the *Nautilus*. Westinghouse itself has $2 million invested in a plant near Pittsburgh, opened last January, turning out parts for use in atomic programs. (For more on Westighouse and industry participation in the atomic program, see p. 96.)

The long-term nuclear market is in power stations. Other sources predict that atomic energy will be used in 10 per cent of new plants built after 1960 and in 20 per cent by 1985. Westinghouse and the Duquesne Light Co. are building the first large-scale plant, to produce at least 60,000 kilowatts.

Mr. Price said that he was confident that a period of great growth lies ahead for American industry and for electrical manufacturing in particular.



Fresh Air Elevator

Elevators with a combined 5000-lb capacity will be built inside this framework of interlacing pipe being erected in Kansas City, Mo. Inadequacy of inside elevator service compelled workmen remodeling the courthouse there to build the outside hoist. Bridges of piping material will stretch from the hoist to the building so that materials can be carried across the spans

GE Earnings Up 20 Per Cent

General Electric Co. earnings ($140,691,000) for the first nine months of 1954 topped those of the similar period of 1953 by 20 per cent despite a 7-per-cent decline from last year's record nine-month sales of $2,341,048,000. Nine-month sales this year totaled $2,167,397,000.

Provision for federal taxes and renegotiation for the three-quarter period amounted to $153 million, compared to $257 million for the same period in 1953.

GE President Ralph J. Cordiner said sales in September were much better than they had been for the past several months. Sales of defense products continued to be lower, as anticipated, he added, but he predicted sales of commercial lines for the year should nearly equal the high level attained in 1953.

There was a marked increase in heavy apparatus orders in September and sales of appliances took a definite upturn during the month.

A dividend of 40 cents per share of common stock will be paid for the third quarter.

Steel Wire Walls for Parking Garage

Curtains of stainless steel wire strand on 8-in. centers are the only outside walls of this new city-owned, 12-story parking garage being constructed in Chicago. The 568 strands of wire are suspended at roof top, pass through tubular sleeves in each floor and are secured at the bottom by turnbuckles and springs at 1000-lb tension. An estimated $65,000 will be saved by using the steel strand

Wanted: Ways To Solve Water Problems

Industry's headaches will get worse as pollution and shortages mount. Current investment of $1 billion in treatment and $2 million yearly for research must be increased

ALTHOUGH many areas are hampered by water shortages, industry will need 170 per cent more water by 1975, the government estimates.

Add to that the ever-increasing cries for more water for recreation and demands for tasteless, odor-free drinking water, and you have the nub of the problem.

Finding the Answers—Industry is attempting to find the answers. It's spending more than $2 million a year for research and has more than $1 billion invested in water-treatment facilities. It has found that one solution is to re-use water supplies where successively poorer water is permissible. But this approach does not eliminate the problems of final disposal, which become more and more acute with each use.

Richard D. Hoak of the Mellon Institute says research can get the biggest immediate rewards by finding out what proportions of contaminants can be tolerated in waste water and by establishing standards for industry to follow. He points out: "Recreational water cannot be provided everywhere because a legitimate use of surface water is to assimilate the residual waste of civilization. This is an essential function. Its prohibition would eventually force us back to an agrarian economy."

New Angles—Research can also help by turning up new uses for wastes. Ways have been found to use spent pickle liquor from steelmaking for recovering manganese from low grade ores and for making ammonium sulphate for fertilizers.

Looking at the problem from a different angle, H. R. Wallrath of General Electric Co. asserts that disposal capacity has not kept pace with the growth of industry and the cities. He estimates that national expenditure of $600 million for sewage treatment, if tripled for the next five years, would ease the problem and realistically provide for growth.

Future—He sees an immediate need for 6700 new sewage plants and 3500 industrial waste facilities. He also says that many of the existing 6600 plants are inadequate and must be expanded.

But whichever way you look at the problem, it's industry's baby. Both research and expanded treatment facilities must be paid for from industry's pocket. But there's a cheerful note. Any spending to improve facilities will promote growth for all industries.

"I Told You So," Says Pentagon

That is what Defense department proponents of a proposed steel marking standard are saying in the light of the failure of the steam piping system in the $55-million atomic submarine, *Nautilus*. It is under construction by the Electric Boat Division of General Dynamics Corp. at Groton, Conn.

According to Pentagon statements, the trouble occurred because welded and seamless pipe in Electric Boat Division's stockroom looked exactly alike, so that both welded and seamless were installed in the piping system. The failures, a Navy statement said, occurred in the welded tubing. Proponents of the marking standard say that had the tubing been marked to identify it as to composition, method of manufacture, etc., the trouble would not have occurred.

The steam system in which the failures occurred is the secondary system that handles steam generated by the heat transferred from the atomic plant. The primary nuclear power plant is not involved.

Consequently, the Atomic Energy Commission announced that the same defective steam piping arrangement that failed in the *Nautilus* test went into the steam portions of the land base prototype of the atomic power plant for the *Nautilus* and the *Seawolf* (that's the second atomic submarine under construction at Groton) and would have to be replaced.

These piping units were built by Electric Boat from both welded and seamless pipe. Repairs will be made at the company's expense.

Cut Trucking Costs Of Small Shipments

SMALL SHIPMENT COSTS by truck could be cut 20 per cent.

But you and other companies will have to co-operate to eliminate shipping and dock delays which cost more truck driver lost time than traffic.

So claim New York management consultants Drake, Startzman, Sheahan and Barclay. The firm recently completed a study of less-than-truckload shipments and came up with these suggestions for improving your dock operations as well as helping to cut carrier costs.

1. Create the post of director of physical distribution to direct materials handling, warehousing, shipping and receiving, transportation, layout, packaging and material control. A director can coordinate these operations for greater efficiency.
2. Plan and schedule receiving and shipping over longer periods. It'll save congestion, reduce errors and high labor costs. Too many companies set up midmorning receiving and midafternoon shipping and waste the rest of the day.
3. Review your shipping and receiving methods. Apply the methods engineering you use in production to receiving and shipping.
4. Check your facilities for too few truck spots, lack of apron space for maneuvering trucks to the dock, lack of operating space for sorting inbound and assembling outbound shipments. Does your layout permit the best possible flow?
5. Segregate shipments by carrier to speed up loading and reduce errors.
6. When possible, pack in smaller units (60 lb and under), so that one man rather than two or more are required to handle the unit.
7. Make sure all bills of lading and package markings are legible, accurate and complete. This will prevent delay, misrouting and loss.
8. Notify the carrier of your requirements. This helps him schedule his equipment for better efficiency.
9. Check freight and segregate by carrier when you floor it in shipping department. Then driver can easily make his total-piece count.
10. If carrier drops trailers at your dock for your people to load, tell the carrier's dispatcher the destinations of the shipments. He'll give you a sequence for loading, so the freight can move straight through destination without going through the local terminal.
11. If you're a large shipper, prepay freight charges. This reduces the number of invoices and payments the carrier must process and cuts down his office expense.

Building for Sales

Machine tool distributors hike association dues, hire manager to aid selling efforts

WITH THE SHIFT from order taking to high level selling in the capital goods industry, nearly every sales organization is undergoing some rebuilding, re-educating and re-emphasizing. Machine tool distributors are no exception.

At their 30th annual meeting in Cincinnati last week, members of the American Machine Tool Distributors' Association discussed sales problems in almost every formal session, in the hallways, lobbies and hotel rooms.

More Strength—They announced that as a group they will have stronger dollar muscles in the future. Outgoing President Thomas R. Rudel pointed out: "Recognizing that increased activities meant increased expenses, our members voted a new dues schedule which more than doubles our former income and permits of a far more liberal budget."

Part of the increased budget is already accounted for with the hiring of James Kelley as association general manager. His job: To increase activities and make them more effective. Mr. Kelley was deputy director of BDSA's Metalworking Equipment division.

Tax Advantages—Also hitting the sales-emphasis theme was Herbert L. Tigges, National Machine Tool Builders' Association president. He urged the distributors to stress to prospects the advantages of the new depreciation law provisions. Sales outlook for next year is brightened by the proposed $100-million government purchase of machine tools (see p. 97).

Mr. Tigges also hit the Washington talk about giving the armed services a voice in the control of leasing government-owned machine tools. Office of Defense Mobilization, which has the control, countered quickly that the suggestion of armed forces control of leasing has been dropped.

Raymond A. Vidinghoff, president of Machinery Associates Inc., Wynnewood, Pa., was elected president of the distributors' association, succeeding Mr. Rudel.

NEA

Blush Is Off the Baby Boom

About 4 million babies will be born in 1954. That'll probably be the high water mark until late 1960s. Metal manufacturers are finding the baby market tough to sell currently

SALES CURVES of metal baby goods are not exactly following the birth rate curve.

It's not possible to give industry-wide dollar sales for strollers, crib mattresses, high chairs, car beds, etc. Manufacturers of such goods do not report figures to a central agency.

Word of Mouth—The only estimates on sales available are word-of-mouth reports from the field. They indicate there was a definite post-World War II bulge in hard goods for babies sales. Business was good. Established baby goods firms began branching out into allied lines, and new firms came into being, often making similar (though usually less expensive) models of well-known lines. All went well until late 1952.

Though the birth rate continued to mount (see the table below), sales of metal baby goods began to even off. By early 1953 sales were definitely drooping. Now they're down 15 to 20 per cent from 1952 and about equal with last year.

Natural Results—Terrific price competition is going on among off-brands with pressure filtering down on prices of even well-recognized merchandise. Many firms are leavin the field.

This competitive condition is surprising in view of the ever rising birth rate. New births may total a record 4 million in 1954:

1946—3,288,672	1950—3,548,000
1947—3,699,940	1951—3,758,000
1948—3,535,068	1952—3,824,000
1949—3,559,529	1953—3,909,000
1954—4,000,000	

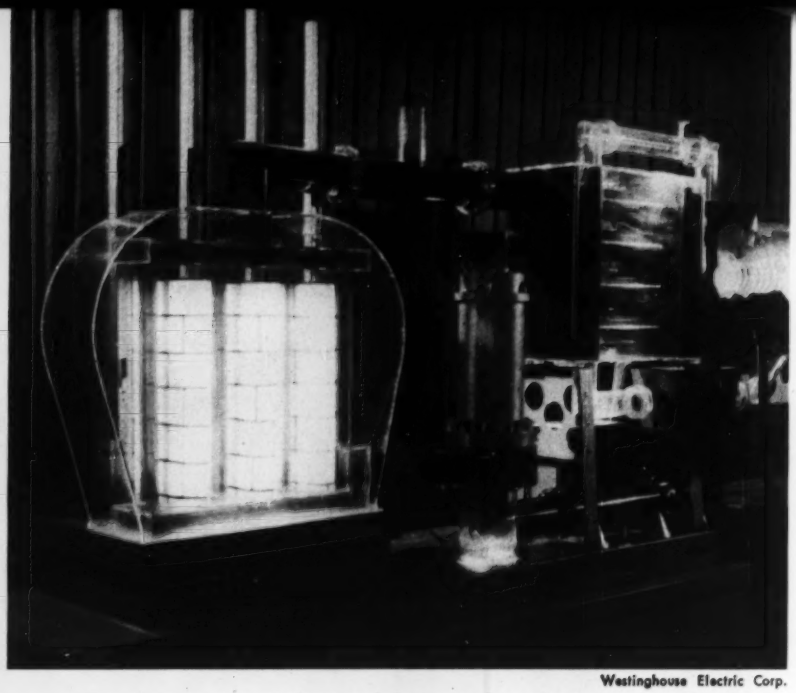
One explanation for the sales enigma is that the latter-day baby boom is based on second, third and fourth babies. Metal baby goods, bought for a first child, can be reused through that many offspring.

Still it's a good business if approached properly with the right product. Says D. W. Gill, vice president and general manager, Frank F. Taylor Co. (Taylor-Tot), Cincinnati: "I don't believe we would solve our competitive problems by trying to jump into somebody else's backyard. We're concentrating on offering a finer product and better service on our established lines. We believe sales will get better instead of worse next year."

A. E. Peterson Mfg. Co., Glendale, Calif., came into the competitive market with an altogether new item that has caught on. It's a lightweight folding stroller made of tubular aluminum. Says this firm's president-general manager, A. E. Peterson: "Unit sales will undoubtedly be higher (this year) than (they were) in past years . . ."

Look Ahead—Metalworking manufacturers in this field foresee no early end to the present competitive conditions—not before the late 1960s, when World War II babies begin to have families of their own.

In the meantime, most of the firms in the field are producing at 80 to 85 per cent of capacity. That's enough to sustain a fair amount of prosperity for them, even though it's well below the apparent operating rate of American father and motherhood.



Westinghouse Electric Corp.

Development is at the model stage, but don't worry about . . .

Competition from Atoms: It's Years Away

Radiation protection must be solved and initial costs are still too high for many practical uses, oil industry official points out

THERE'S GLAMOUR aplenty in atomic energy development; but it's also true there's little chance for an immediate adverse impact on your operations.

Dr. Robert E. Wilson, Standard Oil Co. (Indiana) board chairman, recently gave his views on the impact of atomic energy on the oil industry before the National Industrial Conference Board's atomic energy conference. His points also apply to much of metalworking.

Just a Glance—No important phase of the oil industry will be adversely affected by atomic energy, he said, adding: ". . . at the end of 20 or 25 years we might turn around long enough to say 'Was that a mosquito that bit us?' and then go on trying to handle our growing business."

Citing atomic power plants as an example, Dr. Wilson said that few, if any, plants would be built for purely commercial purposes in this country within 10 years. Between 10 and 25 years a moderate proportion of new plants might be built to use atomic fuel, but no efficient existing plant would be shut down or converted to atomic fuel.

High First Cost—Use of atomic power for commercial ships will develop even more slowly, he pointed out, because of the high first cost of atomic power plants.

He labeled "remote" the possibility of atomic energy fuel for large locomotives. "Even if this proved both safe and economical in normal service—which I seriously doubt—can you imagine either the railroads or the regulatory authorities being willing to risk a possible wreck of an atomic engine in one of our large cities?"

Autos Out Too—"Fantastic," he called the idea of atomic-powered cars, busses or trucks because of the tremendous cost of an atomic engine and the necessary radiation protection that would have to be built into the vehicles for passenger protection. Space heating by atomic energy was ruled out for the same reasons.

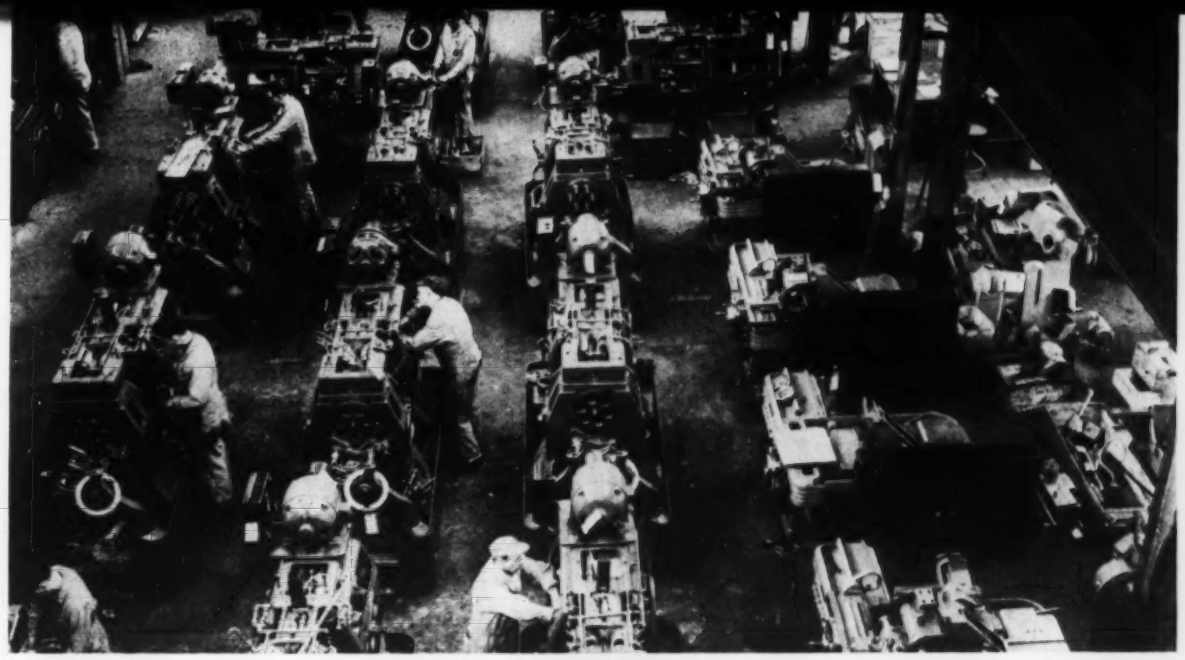
Long and Short Term—For the outlook beyond 25 years, Dr. Wilson said rising costs of petroleum and falling atomic power costs may eventually make the two competitive. But until then, he sees these benefits from atomic energy to the oil industry:

1. Increased travel as industry and population decentralize because of an atomic war threat. 2. Research and operating benefits from the use of radioactive tracers.

AEC Awards Atom-ship Contract

To hasten introduction of nuclear propulsion of large naval vessels, the Atomic Energy Commission awarded a $1.2-million contract to Westinghouse Electric Corp. to develop the power plant.

In connection with the same project, contracts for studying design of large nuclear-powered ships have been let to Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and Bethlehem Steel Co., Quincy, Mass.



Scenes like this may become common again as . . .

Pentagon Plans for More Machine Tools

The Defense department wants to order $100 million worth of capital equipment for defense. ODM expects to launch a $40-million program to build "elephant" tools

THE DEFENSE department plans to award about $100 million in contracts for long lead time machine tools and equipment for defense, says Arthur S. Flemming, director of the Office of Defense Mobilization.

Pentagon spokesmen confirm that, but they say details are classified. No action is expected until next year since the Defense department must report such plans to the two armed services committees of Congress before carrying them out.

Big Ones—In addition, says Dr. Flemming: "We expect to launch a $40-million program for construction of 'elephant' tools." They're large machine tools builders use to make the equipment that turns out military goods. Both the $40-million and the $100-million programs call for capital goods that would be little used in general manufacturing.

In a speech delivered at the "Oil Progress Week" meeting in New York, Dr. Flemming said nothing of the contemplated appointment of an industry advisory committee to: 1. Pass on further proposals to fill in mobilization gaps. 2. To pass on plans to provide key components manufacturing plants with stand-by inventories of critical equipment and materials. Harold S. Vance will head that committee when it is finally formed. The Studebaker-Packard Corp. executive will be assisted by other industry officials, invitations to whom are going out now.

Where and Why—Defense business, says Dr. Flemming, is being placed "to the greatest extent possible with firms already selected as part of the mobilization base." Some 35,000 companies are on the Defense department's list of Planned Wartime Materiel Suppliers. He points out that the prime object of defense procurement is security, so that sometimes orders do not go to the low bidder but to a plant that needs to be kept busy.

In another move to maintain the mobilization base, the ODM boss reports that our stockpile of strategic and critical materials is worth $4.5 billion. An additional $2.5 billion is needed to reach "minimum" objectives.

What About Prices?—Dr. Flemming did not comment about still another aspect of mobilization readiness—stand-by price controls. His silence is another indication that price stabilization work at ODM has been de-emphasized.

No successor has been named for Glenwood J. Sherrard, Boston hotel owner, who resigned as assistant ODM director for stabilization, effective Oct. 31. The only price planning in process is on iron and steel scrap.

There's talk that the responsibility for planning stabilization policies to be imposed in another emergency will be shifted from ODM to the Commerce department's Business & Defense Services Administration.

By E. C. KREUTZBERG *Washington Editor*

Government Withdrawal From Business Continues

Ferreting out and halting government-owned enterprises that compete with private business is a difficult job. Here's a progress report

SALE to Diamond Alkali Co., Cleveland, of the Army's chlorine and caustic soda manufacturing plant at Muscle Shoals, Ala., marks another step in the Eisenhower program to get government out of competition with private business.

Other sales include the Inland Waterways Corp., the Yamsay-Klamath Falls transmission line and the Klamath Falls substation of the Bonneville Power Administration and the Clark Hill-Greenwood, S. C., transmission system of the Southeastern Power Administration.

Out of Service—Negotiations are in process to dispose of the Chugach power plant at Anchorage, Alaska. The synthetic fuel demonstration plant at Louisiana, Mo., has been leased to a private firm with option to buy. National Park Service is getting out of the business of providing electric, gas, water and communications services.

The Rubber Producing Facilities Disposal Commission is trying to get the government's rubber plants into private hands. What to do with the government-owned tin smelter at Texas City, Tex., is under study.

Military in Retreat . . .

Much progress has been made in getting the armed services out of competition with private business.

This year 41 per cent of the cost of maintenance for aircraft modification facilities is being expended with private firms. It will go to 50 per cent (or $625 million) in 1955. In 1952 it was only 21 per cent. The Navy shipbuilding program calls for $1,105 million to be spent in private yards in fiscal 1955 as against only $277 million in Navy yards. The amount of repair overhaul of Navy ships in private yards has been increased from $34 million in 1953 to $61 million in 1954 and will be increased to $82 million in 1955. The Army will increase the percentage of repair and maintenance work on motor vehicles contracted to private companies from 22 per cent in fiscal 1952 to 28 per cent in fiscal 1955. The Army and Navy already have reduced the number of vehicles used for administrative purposes by more than 11,000.

In some cases private industry is mystified by the insistence of the armed services secretaries that certain activities must be retained by the government. While the armed services have discontinued some 30 of the 61 spots for baling and shearing ferrous scrap, and expect to discontinue more, the Navy and Air Force continue to operate 9 of the original 11 aluminum "sweating" furnaces. They take whole airframes and melt the aluminum into scrap.

Language Barriers . . .

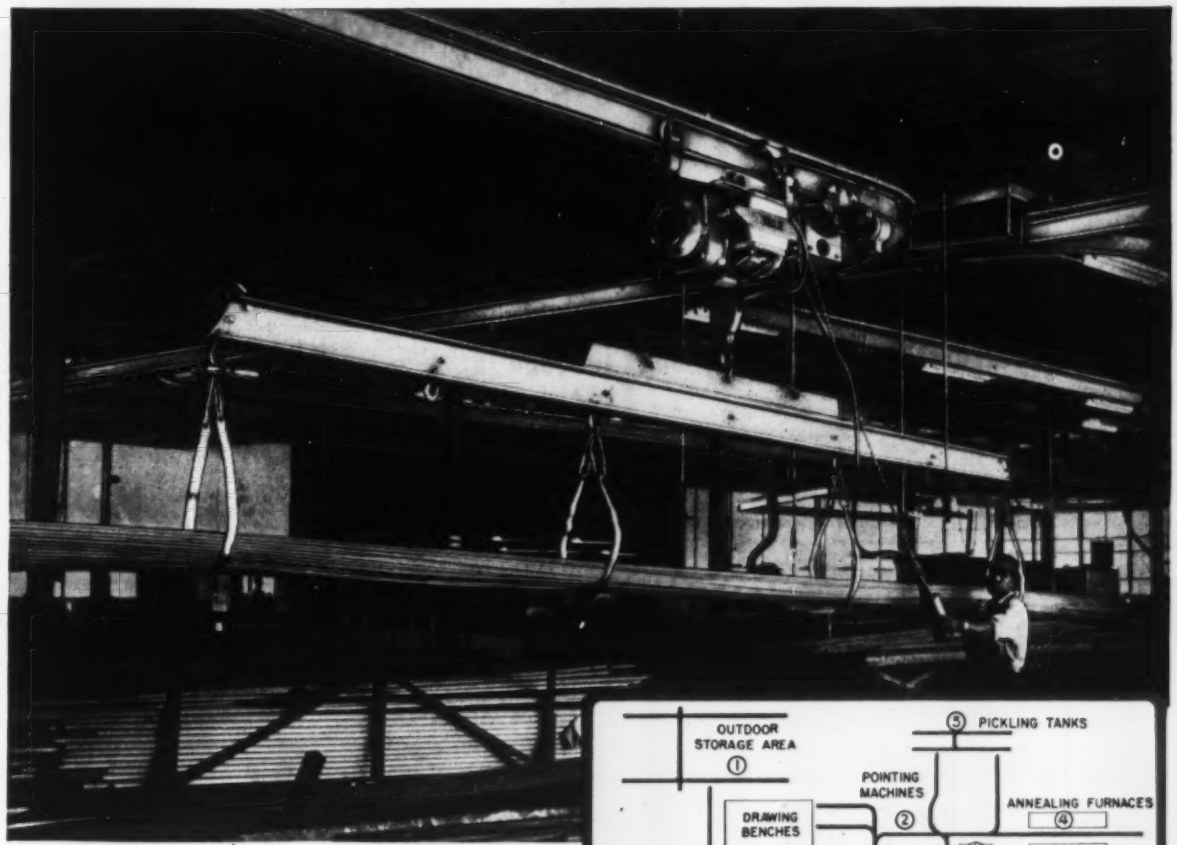
The Bureau of the Budget is having trouble in phrasing a directive under which all agencies would be instructed to help get the government out of competition with private industry. The bureau has been unable to devise criteria that will get the government out of competition without causing it to abandon activities necessary to the national security. The latter angle governs the Defense department in its moves in this program. That department just issued its third list of activities to be studied with a view to discontinuing them. They include armed services manufacture of marking ink and marking devices; laboratory, scientific and engineering instruments; optical instruments and lenses; ophthalmic goods; watches, clocks and parts; surgical and medical instruments; dental equipment and photographic equipment. Unless good reasons to the contrary are found, future business in these categories will go entirely to private firms.

Slippery Issues . . .

Last year a congressional committee reported that the government was competing against private industry in some 100 different businesses, including services and manufacturing. But new activities keep cropping up. For instance, the gear manufacturing industry has complained that the Naval Ordnance plant at Indianapolis and the Rock Island arsenal make fine-pitch gears that ought to be bought from industry.

Congress has butterfingers on this subject. While the House passed a bill in 1954, Senate leaders dropped it. However, Congress is expected to legislate after the new Hoover commission reports its findings next year.

You can do it better with Louden engineered monorail!



Hard-to-handle materials or shapes? Let Louden's long experience lick it.

Louden pioneered monorail handling. This longest and broadest experience with this most adaptable and most flexible of all materials handling methods naturally offers many *extra* benefits to men seeking answers to any handling problems. Shown above is part of a Louden SuperTrack System in a well-known eastern factory where a Louden MotoVeyor makes easy work of the speedy handling of long, flexible, easily-damaged tubing. The hoist has 2,000 pounds capacity and the MotoVeyor travels at 125 feet per minute. This Louden Monorail System also connects with the pickling house where a Louden Monorail Crane speedily and safely handles various sizes of tubing through the series of vats. Benefit by Louden experience on YOUR next handling problem.

THE LOUDEN MACHINERY COMPANY
4710 Broadway, Fairfield, Ia.

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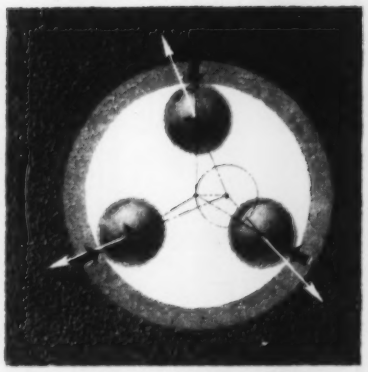
Louden

MONO[illegible]RANES

Since 1867—the first name in materials handling

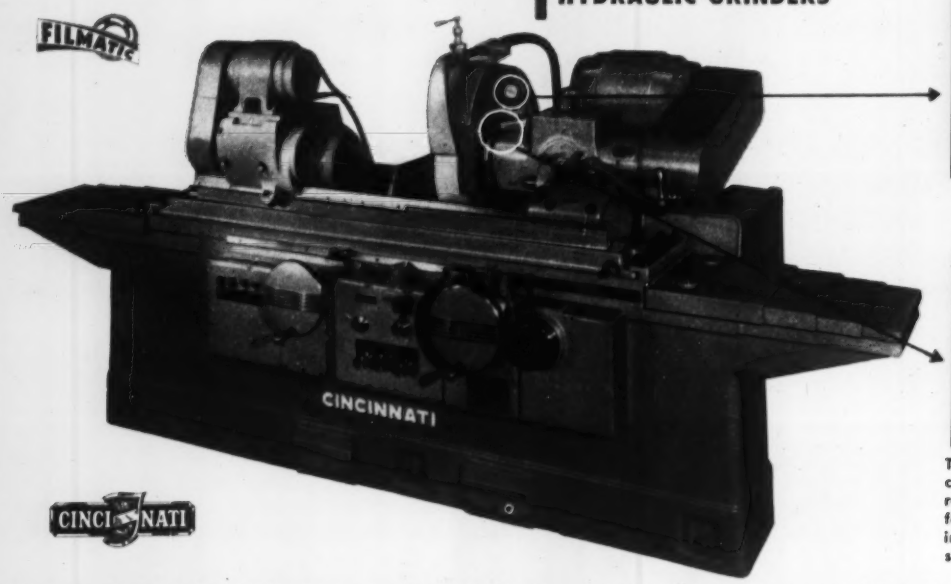
AUTOMATIC GRINDING WHEEL BALANCING

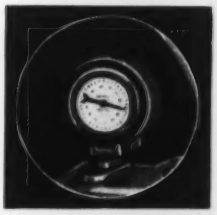


Here's how it works. Three steel balls are carried in a raceway in the wheel end of the spindle. As the spindle rotates, the balls are free to move and correct any unbalanced condition that may exist. Then they are clamped in position.

Now Standard Equipment on Cincinnati Filmatic

6", 10" L, 10" and 14" L PLAIN HYDRAULIC GRINDERS





An indicator needle tells the operator when the system is balanced.

This lever clamps and unclamps the balls in their raceway. Anyone can perfectly balance the grinding wheel . . . in a few seconds' time.

This exclusive Cincinnati feature automatically balances the grinding wheel in a few seconds with the spindle rotating at its operating speed.

Eliminates vibration and resultant chatter . . . permits more effective stock removal; produces superior finish; reduces wheel cost per workpiece.

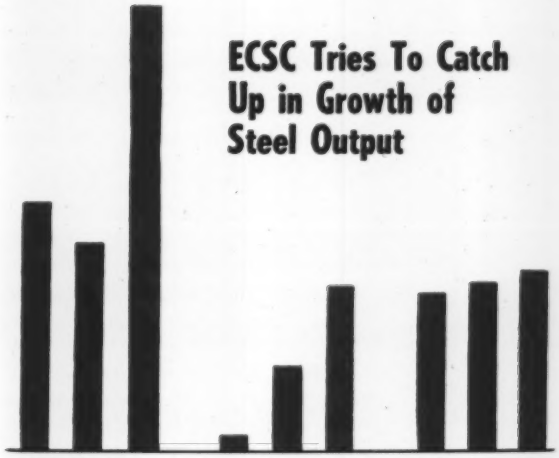
Automatic balancing of grinding wheels climaxes years of Cincinnati research in adapting a fundamental principle of balancing to the needs of precision grinding machines. ¶ Under ordinary shop conditions, using conventional static balancing equipment, even skilled operators will seldom balance the grinding wheels so that a precision balance is obtained. At normal operating speeds the slightest degree of unbalance produces an uneven cutting action. Although not always visible to the eye, this results in a variation of sparking. Cincinnati automatic balancing system is ten times as accurate as conventional static balancing. ¶ Together with trouble-free FILMATIC spindle bearings, automatic balancing of grinding wheels assures smooth, even cutting to closer dimensional accuracy, superior finishes and higher production at a lower cost. ¶ Complete information may be obtained by writing for publication No. G-637-1.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES

ECSC Tries To Catch Up in Growth of Steel Output



U.S. MILLION NET TONS		U.S.S.R. MILLION NET TONS		E.C.S.C. MILLION NET TONS	
1953	111.6	1953	41.6	1953	43.6
1939	52.8	1939	20.7	1939	41.5
1929	63.2	1929	4.0	1929	40.7

LACK of growth in steel output in their areas was a matter of grave concern to the Western European framers of the European Coal & Steel Community (ECSC) and was one of the reasons for the formation of ECSC.

U. S. production had grown from 63 million tons in 1929 to 111.6 million tons in 1953; Russia's output had increased from about 4 million tons in 1929 to 41.6 million tons in 1953; ECSC countries' output had gained very little from 40.7 million tons in 1929 to 43.6 million tons in 1953.

By mid-1954 about 40 per cent more coal and steel was being shipped across the national boundaries within the ECSC community than during the corresponding six months of 1952, the last year before the single market was established. Orders on hand in June, 1954, indicated a further increase in such movements could be expected in the last half. Unofficial output figures show ECSC countries producing at an annual combined rate of 45 million tons thus far in 1954.

FOA Boosts Small Business Exports

Small and middle sized business firms can now afford to follow foreign aid procurement closely. Such information is free. But you, as a businessman, must request the help

LITTLE AND MEDIUM businesses are being courted for foreign trade by the Foreign Operations Administration.

Big companies, which do much dollar volume in FOA-financed trade, keep up with procurement authorizations, what's going to be bought and where. They know, for instance, that the FOA authorized shipments of machinery and vehicles amounted to $166,168,000 to Europe in the 11 months ending May, 1954. During that same period $82,648,000 in machinery and vehicles were shipped to the Far East.

Aim Lower—But the smaller firms are the ones FOA would like to interest in such trade to spread business around. FOA officials believe the basic reason the small and medium firms aren't participating more in FOA-financed trade is that they just don't know what's going on until it's happened.

So FOA is pushing for direct information channels. The catch is that businessmen must initiate the request for information in most cases. And that's where two pieces of literature being offered by FOA come in.

Two Channels—"An FOA Service . . . The Office of Small Business" is a pamphlet that describes the services of that office, including the *Small Business Circular*. The circular contains procurement data broken down into 21 commodity groups. Then there's the *Small Business Memo*, which is a circular containing procurement policies and procedures of the cooperating countries and other foreign trade information of value to U. S. firms. Both these services are available upon request, and they're free.

The booklet, *FOA Financed Commodity Procurement for the American Businessman*, is a bigger look at the FOA. It includes headings on small business services again, how FOA-financed buying is done (there are five channels), procurement information bulletins, buying in individual countries and a list of questions most commonly asked about FOA. This also is available free from Commerce department field offices.

No Excuse—At one time it's possible small business couldn't afford to be as well informed on foreign aid as their larger competitors. But that time is past. These pamphlets are excellent first steps.

First for Colombia

Colombia's first fully integrated steel mill, Empresa Siderurgica Nacional de Paz de Rio, S. A., was formally inaugurated in Belencito on Oct. 13. Costing $120 million, the plant has an annual capacity of about 150,000 tons. It will produce plates, rails and accessories, wire and wire products, round steel bars, reinforcing bars and small angles.

Yardsticks for the Buyer

- Does the product match your needs?
- Is the company established marketwise?
- Is the product competitive in quality, price?
- Is there a reliable nucleus of management?
- Do we share ethics and principles?
- Are the location, plant satisfactory?

Source: Elgin National Watch Co.

Merritt-Chapman Takes Another Step
Marion Power Shovel Co. gets latest bid in Merritt-Chapman diversification program. Company of
Kookuk Firm Buys Skidmaker
Thomas Truck & Caster Co., Keokuk, Iowa, purchased Lanham Co., Louisville, and will operate it as a division under the name of Lanham Skid Co. The latter firm makes skid platform and allied products.
Armco Aquires Fabricator
Southwest Steel Products will be a subsidiary. Firm
Mueller Buys Aluminum Firm
Mueller Brass Co., Port Huron, Mich., purchased Sheet Aluminum Corp., Jackson, Mich., producer of sheet and strip aluminum. This marks another step in Mueller's expansion and diversification program. In 1954
Republic To Buy Chain Firm
Cleveland Chain and its affiliates will become part of Republic Steel by July 15
REPUBLIC Steel Corp. agreed to buy the assets of Co. and
Federal Buys Gardner Electric
Federal Pacific Electric Co., Newark, N. J., maker of electrical distribution and control equipment, acquired Gardner Electric Mfg. Co., Chicago, a transformer
Instrument Firm Changes Hands
Chain & Cable Co., Conn., purchased vic- the capital stock of Conn.
Pfaudler Buys Schock Gusmer
Pfaudler Co., Rochester, N. Y., maker of glass-lined steel and alloy tanks for the brewery and chemical industries, purchased Schock Gusmer & Co. Inc., Hobo subsidiary of Sper Pfaudler will tra operations
Magic Chef To Sell Foundry
Magic Chef Inc., St. Louis, closed its foundry in Indianapolis and is offering it for sale, says Arthur Stockstrom, president. The firm plans to buy all of its castings from outside sources. The firm
Ohrstrom Buys Hammond Mfrg.
G. L. Ohrstrom, Associates, Los Angeles, acquired the working assets of Hammond Mfg. Corp., Pasadena, Calif. Last January, the

So You're Going To Buy Or Sell a Company . . .

There are no hard-and-fast rules, but knowing what to expect may make your work a little easier

"A TOUGH JOB that taxes the best judgment of the best people in the company"—that's the way Elgin National Watch Co.'s I. G. Odell describes this business of buying a company.

If you're thinking of buying or selling a company, remember that each purchase is unique—that's what makes the job so difficult. But there are a few ground rules you can follow.

The Whys—First, why are companies bought? Basically, it's for profit. Gains may come in the form of: 1. Managerial or engineering know-how (it's the cheapest way to get it in a new field). 2. A strategically located plant. 3. Equipment at less-than-new cost.

Why do going concerns sell out? Many seek to put themselves in a better competitive position through increased working capital or to put their owners in a better position, estate taxwise. There are other reasons, but these are most common.

The Hows—Now, if you've decided to buy a company, how do you find one? A hit-or-miss, but sometimes valuable way is to keep your ears open at trade association meetings, industrial shows.

Somewhat more certain to show results is advertising. An unconventional approach was tried with good results by Elgin. It held a press conference in New York for members of the local press, wire services, business magazines and financial press. President James G. Shennan announced that Elgin intended to enter the fields of electronics and instruments. Within 5 days, Elgin had 200 requests for further information and direct requests for consideration from over a dozen companies.

A third way to get prospects, and in some ways the easiest, is to deal through an investment house or a business broker. They frequently know of firms that are on the market and of likely investors. If they don't know offhand, their wide contacts put them in an excellent position to contact both buyers and sellers.

You should have some idea of what field you are interested in. Elgin chose miniature electronics and precision production instruments requiring skills similar to those of watchmaking—still its main line of business. In addition, it set up standards for the "ideal" affiliation: "1. Demonstrated ability to show profitable operation over the last 2 to 5 years. (As a guide, operating profit should be about 15 per cent.) 2. A rapidly growing sales volume with demonstrated potential. 3. Net worth in the order of $1 million. 4. A high degree of engineering background and talent. 5. An established distribution system."

The Quiz — And that's just a starter. Elgin uses a check list of 200 to 300 specific questions. The ones given in the table above are the main ones that must be answered in the affirmative if negotiations are to proceed.

Other factors to be looked into are: 1. Is the company's standing good in its own industry? 2. Is it a good firm to do business with? 3. Is its equipment in good shape? 4. Is the company expanding? 5. What is its labor relations record? 6. Are any supply problems in sight (raw materials, utilities)? 7. Has it any government contracts that will necessitate supplemental agreements between yourself and the government?

The Procedure—Here is a simplified version of the investigative procedure used by Thompson Products Inc. and several other

firms that recently made purchases.

Top management teams from both companies get together (included should be presidents, one or two vice presidents and representatives of the legal and industrial engineering departments). A check is made of financial and operating statements. The seller's facilities are examined, including product, distribution setup, market, technical staff.

The Details—If further investigation is warranted, a complete financial survey is made. Details of profit and costs are closely gone over. If the seller is still a likely prospect, a further check is made into the plant's labor relations and labor rate to see if it is in line with its area. The labor contract is gone over for policy on fringe benefits (specially those regarding pensions, bonuses, insurance).

From the analyses and appraisals of the plant and its personnel, a forecast of the firm's potential is made, and the buying company makes the decision to buy or not to buy. This is the hardest part of the sale; each case can be judged only on its own merits.

The Price—In setting a selling price, the market value of the company's stock is often used as a guide. If the company is closely held, with no market value on its stock, an investment house can usually determine one. Fulton, Reid & Co., Cleveland, does it by examining comparable companies, computing ratios of stock value to book value, working capital, dividends and earnings, and then applying those ratios, weighted in one way or another, to the subject company.

If it is decided to buy only the assets of the seller, a physical inventory must be made. Usually, the price will be about the same as if the stock were bought.

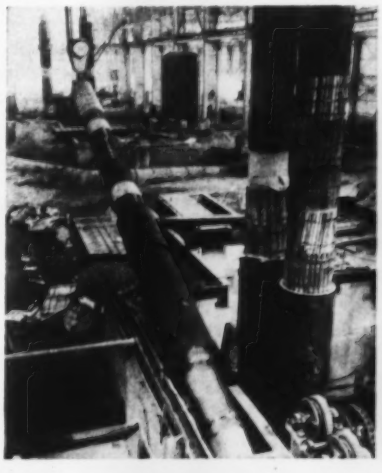
Some documents you should have prepared and keep on file are: Purchase agreement; financial reports; board resolutions from both buyer and seller; escrow agreements, if any; lawyers' opinions on the selling company as to the propriety of its organization; approval of stockholders; statements of accountants; statements as to patents and contracts.

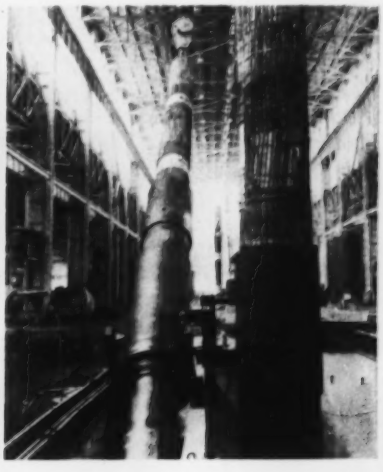
Column for giant forging press towers 75 feet into the air . . .

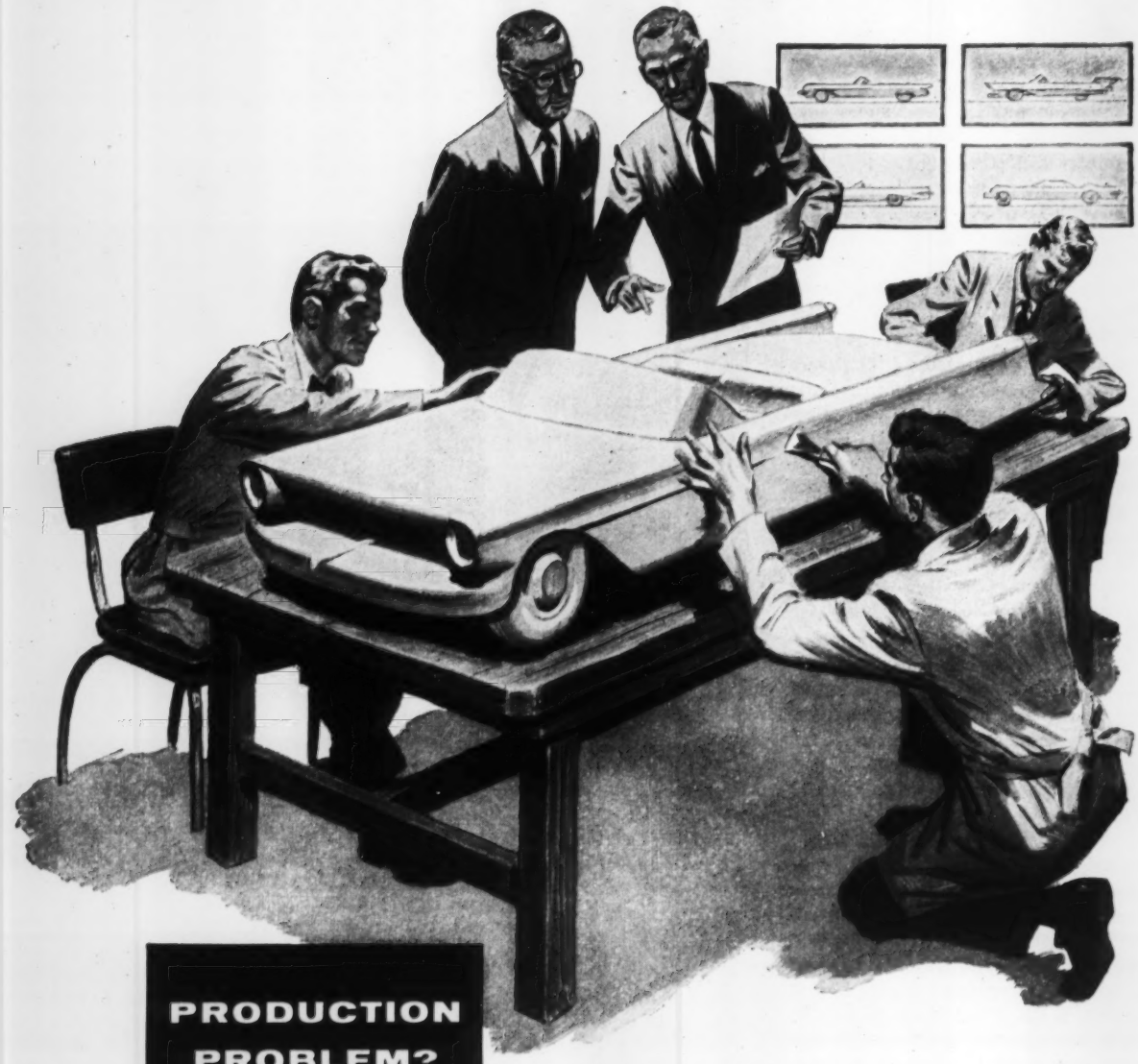
Heavy Press for Light Metal

HANDLING a 75-foot forged column that weighs almost 300,000 lb takes a lot of know-know. Riggers at the Air Force plant of Aluminum Co. of America's Cleveland works raised eight of the big columns in erecting a giant forging press—it uses pressures up to 50,000 tons to squeeze aluminum aircraft sections into shape. A special tilting yoke pivoted the columns into a vertical position as a crane lifted the top end. The 50,000-ton capacity press is being built by Mesta Machine Co., Pittsburgh, under the U. S. Air Force Heavy Press Program.

Lift of the forged column begins . . . and is three-fourths completed







PRODUCTION PROBLEM?

if you use flat-rolled steel talk to a specialist

PROBLEM With present designs and manufacturing facilities, the auto industry needs wide coils of sheet steel with a minimum number of welds. These welds must be cut out before steel goes into the big presses—a costly, time-consuming process.

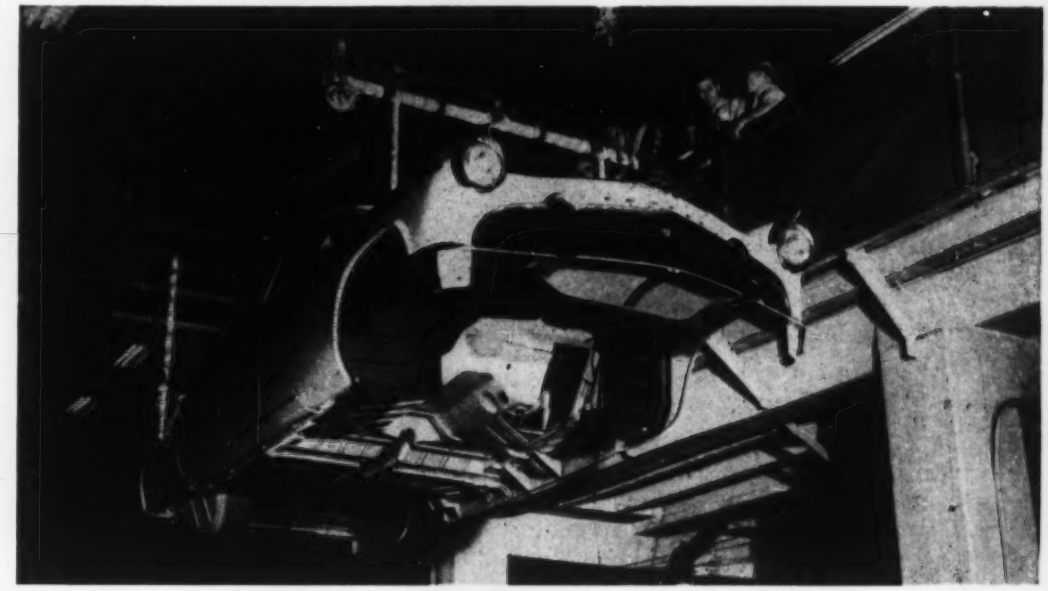
SOLUTION As a prime supplier to the automotive and other industries, Great Lakes Steel has developed facilities which now produce wide coils of steel in greater lengths . . . drastically reducing the number of expensive welds in each coil. Result: important fabrication savings for our customers.

MORAL Whether you make autos, appliances, or farm machinery . . . if it's flat-rolled steel, you can't lose by talking to Great Lakes Steel—specialists in flat-rolled production and application for 25 years.

Great Lakes Steel
Detroit 29, Michigan

UNIT OF NATIONAL STEEL CORPORATION

SALES OFFICES IN NEW YORK, CHICAGO, CLEVELAND, GRAND RAPIDS, LANSING, INDIANAPOLIS AND PHILADELPHIA



As the 1955 DeSoto body drops . . .

Chrysler Moves To Regain Ground with New Models

DETROIT

CHRYSLER CORP.'s new model preview this year was analogous to seeing a co-ed for the first time without her glasses.

Virgil M. Exner, director of styling at Chrysler, is the man largely responsible for the 1955 models' sex appeal. His hand heretofore has been seen only in Chrysler dream cars. In the 1955 models, Mr. Exner culminates a three-year design program with cars it's hard for an auto enthusiast to write adjectives about without being labeled a Chrysler stooge.

Style—For these cars combine a basic litheness of body sculpture that characterizes the unfettered European designer at his best with the utility embodied in characteristic American design, a sort of "Marilyn Monroe as a housewife" approach.

That is not to say that you will like every car in the Chrysler Corp. lines for 1955. In fact, you may find your aesthetic sense outraged by the whole conspicuous bunch. For the corporation's cars this year begin to dabble in an approach to design ideals which are not necessarily as basic in their appeal as Miss Monroe. Symbolisms of speed and sheer ponderosity which are legitimate design approaches are lacking in the cars and will weaken their appeal to many.

Engine Talk—Startling to some was the announcement of the new V-8 engines being introduced this year. The Hy-Fire, new Red Ram and Spitfire engines are not hemispherical combustion chamber engines though ambitious admen have tagged the omnibus label "Polyspherical" to the offering. This is justified by the fact that the exhaust valve seat is located in a polygonal section on the spherical surface and also possibly by the fact that it has a hemispherical sound to it.

The reason for the change is interesting, hinging on cost. When you're designing an engine for a Chrysler you can afford to shoot the works. The hemispherical combustion chamber engine was the result and although it was the most expensive engine in the industry to make because of its double rocker shaft construction, it went into production because Chrysler engineers thought it was the best.

Special Care—Dodge and DeSoto picked up the design because it was proven and put it into production for their models. But with the problem of a new V-8 engine for the Plymouth, a car on which a penny saved means about $6000 per year to the corporation, the engine had to be one which maintained the same standards of volumetric efficiency but at a lower cost.

That's why the less expensive single rocker shaft engine was developed for the Plymouth (see the photo on p. 106). Valves are set at a 25-degree angle to each other instead of 57 degrees as in the double rocker shaft jobs but the opposed valve design is retained. As a result the engine produces about the same power per given displacement as the hemispherical jobs presently in production.

Cost Rules—Use of the engine

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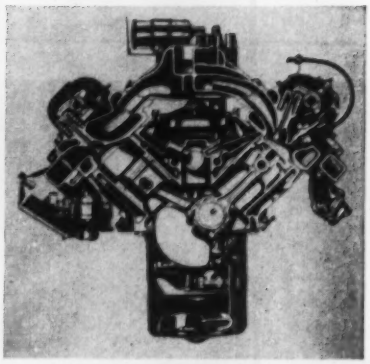
on the Plymouth for which it was designed is quickly comprehended. Use on some Dodges and the Chrysler Windsor instead of the hemispherical jobs is not so readily understood, especially since the hemispherical unit will be retained on some Dodge models and the DeSotos as well as the more expensive Chryslers.

The answer lies in tooling expense. In the case of Dodge, management figures the change can be amortized by cost savings over the volume to be produced. In the case of DeSoto which has low volume, the change is not thus warranted. The Chrysler Windsor required a new engine anyway to replace the old L-head six and since the car is almost identical in body and trim with the New Yorker lines which it must undersell, the saving in the new engine was particularly desirable.

Competitive—The new engine appears to be a good product competitive with other units on the market. But although the new engines have considerable horsepower cushion, they lack the tremendous potential that was the forte of the original Firepower design. Should the horsepower race continue too long, Chrysler engineers will be confronted with the choice of increasing engine displacement and undesirable engine weight or reverting to the hemispherical design in lines with the new single rocker shaft job.

Other Features — Among other features of the new models are a swept-back type of wrap-around windshield and increased horsepower on the solely retained Plymouth and Dodge six-cylinder engines. Length has been increased as much as 10.5 inches on the Plymouth sedan and 16.1 inches on the Dodge special club coupe. Height has been reduced over two inches on some models and the transmission selector lever for PowerFlite available on all lines is located on the instrument panel. The coaxial Chrysler power steering unit is available on all new cars of the corporation.

Although horsepower figures aren't being released at this time, the firm indicates they will be increased as much as 50 per cent on some models with all cars sporting new suspension and frames in addition to 56 solid exterior colors and 173 two-tone combinations and some three-tone treatments.



New single rocker shaft engine for Plymouths, some Dodges and Windsors

In Advance—In case you hadn't noticed, that's a lot of information for a company to release about its new models before the introduction date. In fact, about 200,000 service station operators throughout the country last week received service information sheets concerning the 1955 Plymouth.

The whole deal appears to be a rather neat jump on the competition. With the 10,000 corporation dealers holding a stock of less than four cars each, such calculated leaks can't hurt Chrysler but they can needle competitors. While Chrysler is busily telling the world to watch for its new cars and why, other firms are trying hard not to admit the 1954's aren't the best buy in the foreseeable future.

Or Else—There's no doubt that 1955 is a year of decision for Chrysler Corp. Garnering only about 13.8 per cent of the auto market during the first seven months of this year, the firm set its sights at 20 per cent next year. But President L. L. Colbert points out, "Today that goal is beginning to look very modest. First, we're shooting for 20 per cent of the market, and when we hit that target we'll raise our sights still higher."

Chrysler Corp. has laid $250 million in tooling on its lines for 1955. Most observers figure it looks like a good bet.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,249	684,843
June	623,732	713,778
July	543,534	756,592
August	523,785	640,186
September	364,443†	605,228
October		651,153
November		457,852
December		529,588
Total		7,815,877

Week Ended	1954	1953
Sept. 18	74,026	146,912
Sept. 25	71,017	140,953
Oct. 2	84,110	142,824
Oct. 9	81,610	148,779
Oct. 16	61,286	152,743
Oct. 25	78,000*	149,794

Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

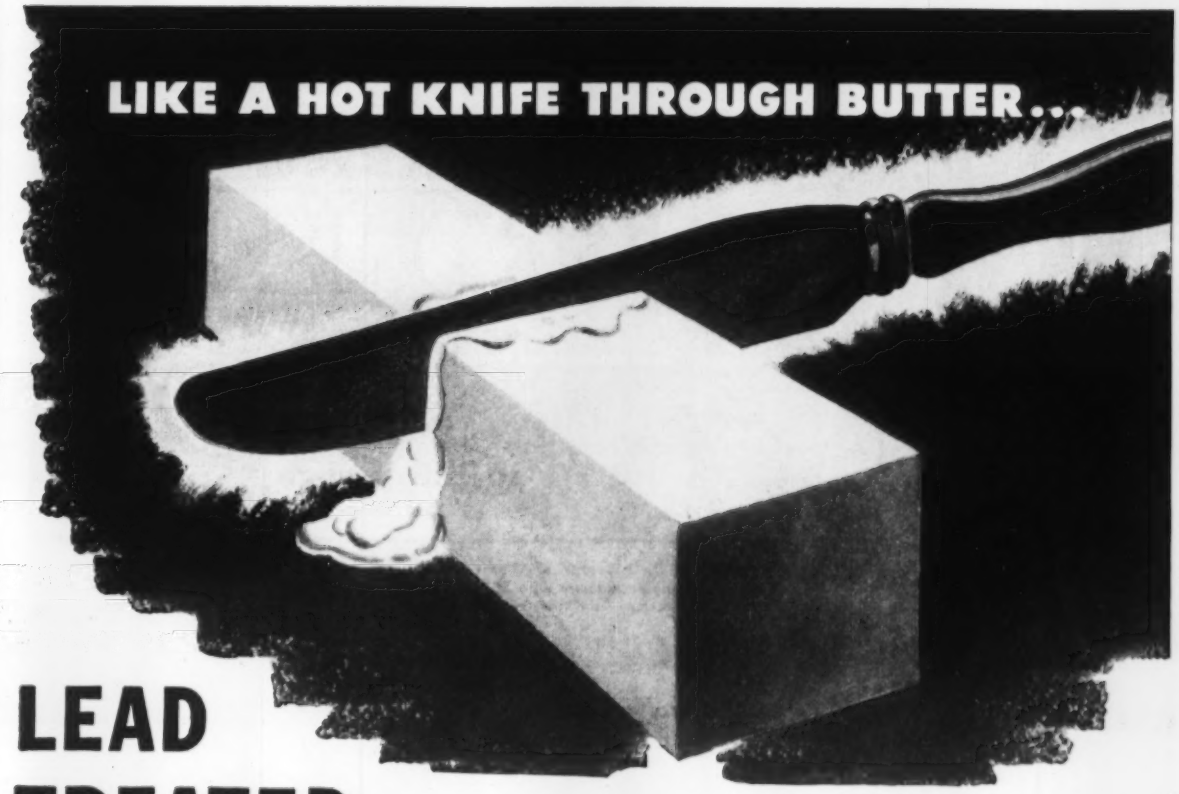
Dodge Truck: Real Pickup

No vehicle more deserves the title "pickup truck" than the new Dodge V-8 Buckboard. This little wagon can be speed-shifted all day long with disastrous results only to adventuresome "hot" traffic light competitors. Zero to an indicated 60 mph took only about 12 seconds and the truck lays down rubber at the drop of an accelerator.

Interest in the truck was stimulated, of course, by the fact that the vehicle is powered by the new Plymouth engine albeit somewhat modified and the power to weight ratio should be similar. Suffice it to say that with Ford and Chevrolet going to 160-plus horsepower and the Plymouth probably to be in the same league, rear tire sales for the lighter makes are going to soar next year.

The Dodge truck packs only 145 hp but with torque of 215 foot pounds at only 2400 rpm. Yet power-packed as it is, the truck delivers more than 24 miles per gallon for some owners. The engine also powered a similar truck recently in a 50,198-mile endurance run without mechanical adjustments or mechanical failures.

After a week's experience, it looks like the Dodge truck would make fun out of most hauling jobs though the more competitive-minded drivers might object to having their power-to-weight ratio disturbed by a load.



LEAD TREATED ARISTOLOY *CUTS CLEAN AND FAST*

"Machine tool production increased 35 to as much as 75 per cent"—users of leaded steels report. The addition of lead acts as a lubricant reducing friction between chip and tool. The beneficial results—faster machining speeds—much longer tool life—and vastly improved product finish. With normal heat treating, mechanical properties such as yield strength, tensile strength and ductility are unaffected.

You can obtain similar manufacturing benefits by specifying Aristoloy *leaded* alloy or Ledloy* (leaded) carbon grades. Available in all A.I.S.I. or S.A.E. standard analyses—write or call today for information about application of free cutting leaded steels to your products.

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Proof of *INCREASED PREFERENCE for WISCONSIN HEAVY-DUTY Air-Cooled ENGINES

3 TO 36 H.P. Range

*Based on U. S. Bureau of Census Statistics, Wisconsin Motor Corporation leads the engine industry with 50.72% of total production in 11 to 176 cu. in. displ. bracket — an industry-wide gain of 1.33%, as summarized below.

Once more U. S. Bureau of Census statistics provide authentic proof of outstanding preference for Wisconsin Air-Cooled Engines in the internal combustion engine field.

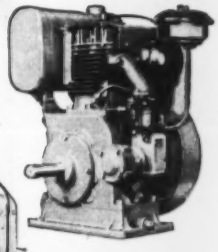
The latest "Facts for Industry" census report, released July 19, 1954, reveals the interesting fact that Wisconsin Motor Corporation produced 5,605 MORE engines in the 11 to 176 cu. in. displ. census grouping than ALL other internal combustion engine manufacturers combined, during 1953. This refers, of course, to engines built for re-sale, exclusive of automotive, aircraft, outboard, miniature and "captive" engines.

Translated into industry-wide percentages, census figures indicate that this company showed a gain of 1.33% over the combined production of all other engine builders. This, however, is an ultra-conservative figure inasmuch as the Wisconsin line covers a range of 13.5 to 154 cu. in. piston displacement whereas the Census Report grouping covers engines from 11 to 176 cu. in. displacement. In spite of this fact, Wisconsin Engine production amounted to 50.72% of the Industry's total in above grouping.

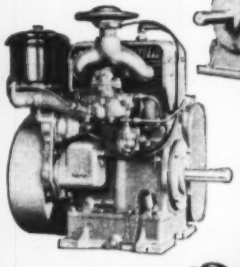
Statistically, these figures are interesting to us as evidence of consistent progress. To the Original Equipment Builder, Distributor and User of engine power, this report provides definite proof of INCREASED PREFERENCE for Wisconsin Heavy-Duty Air-Cooled Engines among people who are best qualified to judge comparative engine values in terms of performance, economy and low-cost maintenance.

You can't go wrong if you specify WISCONSIN Engines for the equipment lines you *sell, build* or *use*.

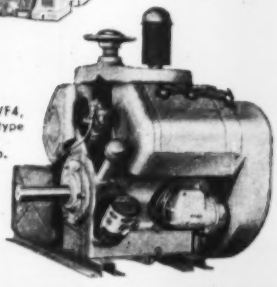
Models ABN, AKN, AEN, 4-cycle single cylinder, 3 to 8¼ hp.



Models AFH, AGH, AHH, single cylinder, 6 to 9 hp.



Models TE, TF, TFD 2-cylinder 7 to 15 hp.



Models VE4, VF4, and VG4D, V-type 4-cylinder, 15 to 36 hp.

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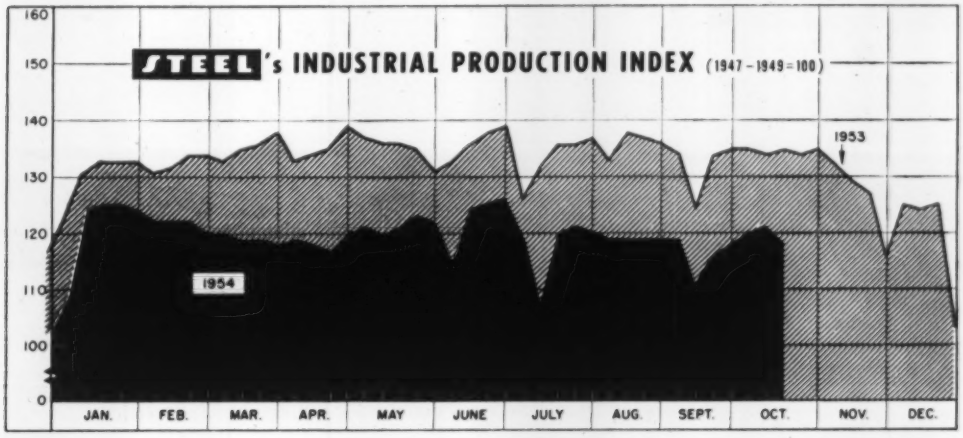
World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

A 7747-1PC



* Week ended Aug. 28

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%.

Local Government: National Metalworking Market

STATE AND LOCAL government spending is due for even closer attention from businessmen. In recent years spending by states has actually exceeded federal government outlays for purposes other than national defense. And with federal spending on the downgrade for just about everything, the states' spending will assume even more importance.

The states spent about $17 billion in fiscal 1953, says the Federal Reserve Bank of Cleveland. This was 6 per cent above 1952 expenditures, and the rise is continuing. Outlays in 1954 and into 1955 should average well over $1 billion higher than the 1953 figure.

Who Gets It — Where do the states spend their money? Highways (see STEEL, Oct. 18, p. 49) and education account for over half of general expenditures. Highways alone take about a quarter of the money, on a nationwide basis. In some states, though, highway spending is considerably over 25 per cent of the total. In recent years it has been the fastest rising budget item.

In 1953 highway expenditures totaled over $3.5 billion, an increase of 34 per cent over those in 1950. Bigger gains may be expected if action is taken on the federal government's estimate that $5 billion in new highways are needed annually for the next ten years. The way things look, state highway departments and road contractors should be good metalworking customers for quite a while.

New and Old—Toll roads have caught the public's fancy, but regular highway facilities still account for a healthy 72 per cent of road expenditures.

Spending for education in 1953 was $4.4 billion or 30 per cent of total expenditures. Most of this was in grants to local governments. The full impact of the baby boom (see p. 95) has yet to

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,755	1,735	2,142
Electric Power Distributed (million kwhr)	9,070[1]	9,193	8,265
Bitum. Coal Output (daily av.—1000 tons)	1,375	1,332	1,546
Petroleum Production (daily av.—1000 bbl)	6,138[1]	6,152	6,311
Construction Volume (ENR—millions)	$259.3	$192.9	$268.9
Automobile, Truck Output (Ward's—units)	61,286	81,610	152,743
TRADE			
Freight Car Loadings (unit—1000 cars)	686[1]	703	823
Business Failures (Dun & Bradstreet, no.)	218[1]	230	169
Currency in Circulation (millions)[3]	$30,159	$30,051	$30,412
Dept. Store Sales (changes from year ago)[3]	−2%	−2%	−5%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$15,795	$20,277	$15,899
Federal Gross Debt (billions)	$278.8	$278.9	$273.0
Bond Volume, NYSE (millions)	$14.9	$15.3	$11.9
Stocks Sales, NYSE (thousands of shares)	10,587	10,788	5,743
Loans and Investments (billions)[4]	$85.3	$83.2	$79.1
U. S. Gov't. Obligations Held (billions)[4]	$37.6	$35.7	$31.4
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.38
STEEL's Nonferrous Metal Price Index[6]	218.9	218.8	202.4
All Commodities[7]	109.7	109.6	110.1
Commodities Other Than Farm & Foods[7]	114.6	114.6	114.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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Superior production capacity and know-how means **lower costs** from Anti-Corrosive, America's oldest and largest firm dealing **exclusively** in stainless steel fastenings!

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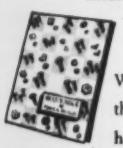

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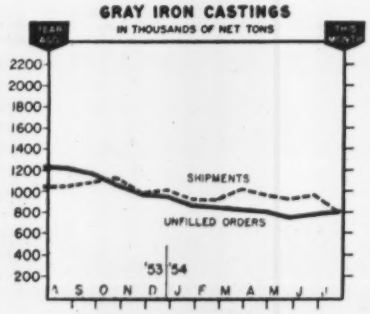
ANTI-CORROSIVE METAL PRODUCTS CO., INC.

Castleton-on-Hudson New York

THE BUSINESS TREND

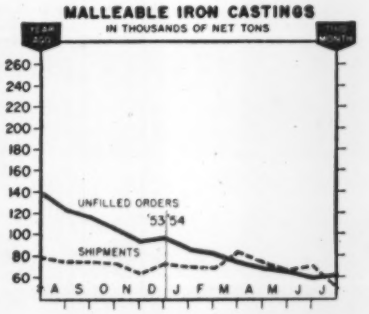


Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1954	1953	1954	1953
Jan.	932	1,162	872	1,333
Feb.	936	1,136	865	1,332
Mar.	1,047	1,264	842	1,376
Apr.	995	1,277	826	1,306
May	943	1,186	775	1,272
June	987	1,196	804	1,246
July	821	1,056	829	1,233
Aug.	...	1,069	...	1,223
Sept.	...	1,106	...	1,170
Oct.	...	1,142	...	1,076
Nov.	...	1,004	...	977
Dec.	...	1,032	...	955
Total	...	13,630		

*For sale. U. S. Bureau of the Census.

Charts Copyright 1954 STEEL.



Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1954	1953	1954	1953
Jan.	70.3	87.2	85.6	174.8
Feb.	69.1	86.5	81.6	175.1
Mar.	84.3	94.5	74.2	177.8
Apr.	74.5	95.9	69.1	174.5
May	67.9	82.1	67.0	160.4
June	72.8	86.5	60.2	151.0
July	50.9	77.1	63.7	137.3
Aug.	...	73.9	...	120.8
Sept.	...	74.3	...	114.5
Oct.	...	73.5	...	104.0
Nov.	...	63.4	...	93.2
Dec.	...	72.1	...	95.6
Total	...	966.9		

*For sale. U. S. Bureau of the Census.

be felt by the nation's schoolhouses. More buildings, furniture and equipment will be called for.

Employment—Not to be forgotten are the 1 million state employees, one-sixth of all public employees. Their payroll means more sales for cars, homes, appliances.

Three-fourths of state revenue comes from taxes, with the biggest chunk coming from sales and gross receipt taxes, which amount to 43 per cent of state income. In states having a general retail sales tax, this brought in over half of all revenue. Those states have probably fared pretty well during the recession because of continued high level of retail sales. Those depending more on corporate taxes probably had a decline in income, but, even so, total state spending bids to continue high.

Although states tend to overspend like their big brother in Washington, they don't do it in such grand style. For the 48, outgo exceeded revenue by only 1 per cent in 1953. The difference is almost sure to be slightly larger this year, but total state debt is less than 5 per cent of federal debt of around $275 billion.

Competition Ahead . . .

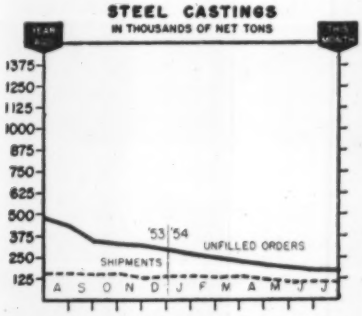
With industrial production moving upward, the tendency is growing to look beyond even 1955. Great economic progress and keen competition during the next ten years are predicted by Murray Shields, vice president and economist of Bank of Manhattan Co. There is no likely possibility of another depression like that of the 1930s, he says. But it is likely that "in the next 10 years almost every major industry will at one time or another experience its own little depression."

Along the same line, Allan Sproul, president of the Federal Reserve Bank of New York, says that depression is unlikely. "We have moved out from under the shadow of the 1930s. Businessmen more and more seem to have their sights fixed on the almost certain long-term growth of the economy rather than on the short-term swings."

Autos Aim High . . .

Autos will soon add considerable strength to industrial recovery with production building to a peak in December. Automakers are scheduling 1.3 million completions

STEEL CASTINGS
IN THOUSANDS OF NET TONS

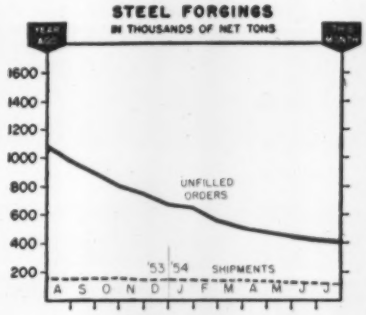


Thousands of Net Tons

	Shipments 1954	Shipments 1953	Unfilled Orders* 1954	Unfilled Orders* 1953
Jan.	122.8	167.2	251.8	706.5
Feb.	116.5	175.7	234.6	644.3
Mar.	122.3	182.2	214.3	634.6
Apr.	105.8	179.6	197.9	573.6
May	94.6	165.6	182.5	525.0
June	100.0	164.7	169.6	475.8
July	75.8	139.6	170.6	467.9
Aug.	....	141.3	....	418.9
Sept.	....	135.3	....	327.2
Oct.	....	140.7	....	313.7
Nov.	....	114.1	....	308.5
Dec.	....	123.3	....	278.4
Total	....	1,829.3		

*For sale. U. S. Bureau of the Census.

STEEL FORGINGS
IN THOUSANDS OF NET TONS



	Shipments 1954	Shipments 1953	Unfilled Orders 1954	Unfilled Orders 1953
Jan.	139	184	638	1,207
Feb.	127	184	539	1,199
Mar.	130	200	489	1,197
Apr.	116	196	460	1,082
May	107	191	431	1,239
June	113	185	409	1,135
July	97	155	395	1,081
Aug.	...	151	...	974
Sept.	...	153	...	882
Oct.	...	156	...	798
Nov.	...	143	...	740
Dec.	...	143	...	651

U. S. Bureau of the Census. Data based on reports from commercial and captive forge plants with monthly shipments of 50 tons or more.

for October-December, a 12-per-cent increase over the third quarter, according to *Ward's Automotive Reports*. That means hourly rated earnings and new car sales are trending toward unusually high levels for that time of year.

If plans succeed, it will be the second-best fourth quarter in history. In December alone 550,000 vehicles are scheduled. June, the present high month of 1954, saw 504,811 completions.

Good news for the auto industry is that new car dealers are in pretty good shape for new models. Stocks, which were at an all-time high as late as April, established a record for single-month cutback in September when 120,000 units were moved out of inventory. A 35-per-cent slash in factory output helped stock reduction considerably. Stocks will soon be down to about 300,000 compared to 510,000 a year ago.

Railroads Chase the Mail . . .

For another transportation industry, things aren't so good. In addition to lower freight loadings, the railroads are losing some of their mail tonnage.

The Post Office for about a year has been experimenting with flying first-class mail for less than air mail rates. The agency says it can do that at no additional cost to the government; the railroads say it can't.

So the roads are trying to prevent the Post Office from extending the service to the West Coast. They say the loss of mail revenues could lead to discontinuance of passenger trains and a substantial reduction in railroad employment.

Though the service proposed for West Coast states directly affects only five roads, 69 are taking part in the fight against it. They claim they are "materially affected in putting into effect plans for expansion and improvement of facilities for handling mail."

Trends Fore and Aft . . .

Chevrolet expects to equip about 70 per cent of its '55s with the new V-8 engine. Ford so equips between 70 and 80 per cent of its cars, so another real sales battle is shaping up. . . The 59,604 cars completed in the week ended Oct. 16 marked a 2-year low in weekly output. . . Retailers are entering the year's biggest selling season with tempered optimism. Even so, most admit sales should top last year's record.

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KENILWORTH offers the flat-rolled metal user all the advantages the housewife enjoys when she shops at her favorite super market.

He can do all his flat-rolled buying with one telephone call or by seeing one salesman . . . it takes only one order, there's only one delivery to handle and one check pays the bill. He frees himself of all the inconveniences, waste of time and added costs of doing business with several sources . . . and he never has to worry about having the material when he needs it.

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Top performance in turbo-jets and rockets calls for alloy steels that can take it

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Heppenstall's durable high-temperature alloy steel forgings, rolled rings, and billets for drop forgings are notable developments which demonstrate the company's technical skill in meeting the latest demands of the aircraft industry.

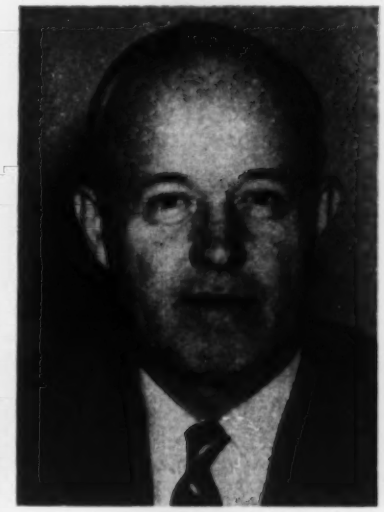
If you have a heat problem involving high-temperature alloys, contact Heppenstall Company — they will be glad to put their knowledge and experience to work for you.

HEPPENSTALL COMPANY

Pittsburgh 1, Pa.

for high temperature alloy forgings, rings and billets

JOHN R. HOWELL
. . . *Sterling Electric sales mgr.*



WARD H. PITKIN
. . . *Oliver United Filters gen. sales mgr.*

N. GEORGE BELURY
. . . *American Brake Shoe v. p.-sales*

John R. Howell, associated with **Sterling Electric Motors Inc.**, Los Angeles, for over 25 years, was made sales manager.

Ronald D. Gumbert was elected a vice president of **Mercast Corp.**, New York, an affiliate of Atlas Corp. He continues as executive vice president of Alloy Precision Castings Co., Cleveland, a Mercast licensee in which Mercast has an interest.

Leo Buchine was appointed vice president and general manager in charge of manufacturing at **Industrial Washing Machine Corp.**, Matawan, N. J. He was formerly with Morrison Steel Co., and prior to that was, for more than 20 years, purchasing and production manager for J. O. Ross Engineering Corp.

Daniel J. Quinn was elected vice president-sales, plumbing and radiator heating division, **American Radiator & Standard Sanitary Corp.**, Pittsburgh, to succeed **D. D. Couch**, who was named vice president-marketing and commercial development.

Ellwood B. Nelson was appointed chief engineer, raw materials, for **Tennessee Coal & Iron Division**, U. S. Steel Corp., Fairfield, Ala. **James G. Creveling Sr.** succeeds Mr. Nelson as general superintendent, coal mines.

Ward H. Pitkin was appointed general sales manager, **Oliver United Filters Inc.**, Oakland, Calif. Associated with the firm since 1925, he most recently served as assistant general sales manager.

Granite City Steel Co., Granite City, Ill., promoted **Edward D. Badgett** from plant engineer to chief engineer and **Frank J. Burgert** from assistant superintendent to superintendent of its north plant.

Inland Steel Co., Chicago, appointed **James C. Fausch** assistant manager, tin plate and export division. **Samuel G. Wagner** was made assistant manager, sheet and strip division, and **William H. Eichengreen** was named assistant manager of the division to handle sales of secondary products.

E. C. Carman was appointed administrative assistant to the general manager of **New Idea Division**, Avco Mfg. Corp., Coldwater, O. Formerly director of purchases for New Idea's four plants, he is succeeded in that post by **C. E. Antony.**

Edward S. Dik was made assistant to the president of **Abbott Ball Co.**, Hartford, Conn.

Burns Hawkins was appointed a vice president of **Ziv Steel & Wire Co., Chicago.** He is connected with the firm's Detroit branch.

American Brake Shoe Co., New York, appointed **N. George Belury** sales vice president and **Robert B. Parker** assistant to the president for personnel. Mr. Belury continues as president of the firm's engineered castings division.

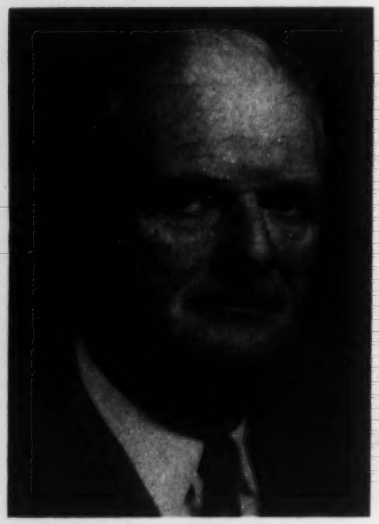
Raymond H. Matthews was made chief engineer of **Fenwal Inc.**, Ashland, Mass. He joined the firm in 1951 and for the last year has served as assistant chief engineer. He previously was with W. M. Chace Co., Detroit.

Robert G. Francis was named manager of production engineering and material for **Marquardt Aircraft Co.**, Van Nuys, Calif.

Cecil W. Farrar was elected vice president in charge of product sales, advertising manager and a director of **W. A Case & Son Mfg. Co.**, Buffalo. **Frank W. Welling** was elected vice president-finance, treasurer and a director.

At **Lockheed Aircraft Corp.'s** new missile systems division, Van Nuys, Calif., **Dr. Sydney H. Browne** was made superintendent of the analytical department, engineering branch; and **C. R. Bumstead**, manager, engineering laboratories department.

John W. DeLind Jr. was elected chairman and **Rowland Burnstan**, president of **Borg-Warner Inter-**



DONALD F. MILLER

PAUL E. LINTHWAITE

. . . executive positions at Turbine Equipment Co.

national Corp., Chicago, export subsidiary of Borg-Warner Corp.

Donald F. Miller, executive vice president, was elected president, **Turbine Equipment Co.**, New York. **Paul E. Linthwaite**, sales engineer, was promoted to vice president in charge of machinery sales. Former president, **Harold Sinclair**, was advanced to chairman of the board.

H. D. Conkey & Co., Mendota, Ill., appointed **R. A. Hossinger** and **H. J. Kettleborough** vice presidents. They succeed **O. J. Ellingen** and **W. G. Van Etten**, both deceased. **Harold B. Goebel** was chosen treasurer to succeed **J. P. Gallagher**, who continues as secretary.

Frank T. Goll was appointed assistant sales manager of **C. A. Norgren Co.**, Englewood, Colo.

James C. Reynolds was appointed manager of the newly created central district for **Westinghouse Electric Corp.'s** air conditioning division. He has headquarters in Pittsburgh. **Dr. W. H. Brandt** heads a new products engineering department, newly formed to co-ordinate with the corporation's research laboratories and the materials engineering department.

Irving G. Bohrman was elected president, **Perfex Corp.**, Milwaukee. He replaces **Carroll E. Lewis**, resigned. Mr. Bohrman has been vice president and general manager of the firm's industrial engine cooling radiator division since 1945. **Ernest H. Panthofer** was elected a vice president.

Kaiser Aluminum & Chemical Corp., Oakland, Calif., appointed **Robert S. Aubry** assistant to the purchasing manager.

Jim Suter was made sales engineer of **Frank G. Hough Co.**, Libertyville, Ill.

Herbert S. Ries was elected president of Republic Gear Co., Detroit, and **Edgar D. Leon**, president of Detroit Bevel Gear Co., subsidiaries of **Gear Grinding Machine Co.** They replace the late **Thomas R. Navin**. Mr. Leon is also president of Gear Grinding which purchased Republic and its subsidiaries Sept. 1. Mr. Ries was formerly Republic's vice president, director of sales.

L. A. Moore replaces **A. G. Gibson** as chief engineer, **Black-Clawson Co.**, Hamilton, O.

Daniel H. Dellinger was made assistant to the vice president, research and quality control, **National Steel Corp.**, Pittsburgh.

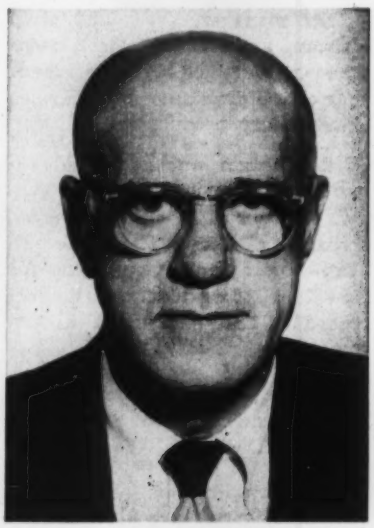
R. C. Findlay was appointed assistant sales manager, engineered products division, **Inland Steel Products Co.**, Milwaukee.

Robert C. Bown was named manager of **Allis-Chalmers Mfg. Co.'s** Evansville, Ill., branch, general machinery division.

Milton P. Veith was made regional manager for the Detroit sales region of Chrysler Corp.'s **Airtemp Division. Warren Fitch** was made regional manager, New Orleans sales region.

Dr. Robert L. Womer, as vice president, heads research and development for **Speer Carbon Co.**, St. Marys, Pa. He formerly was assistant for divisional research, Olin Mathieson Chemical Corp.

D. C. Hart was made sales representative, **Federal Foundry Supply Co.**, Cleveland. He formerly was foundry superintendent, Posey Iron Works. Mr. Hart will service east-



HERBERT S. RIES

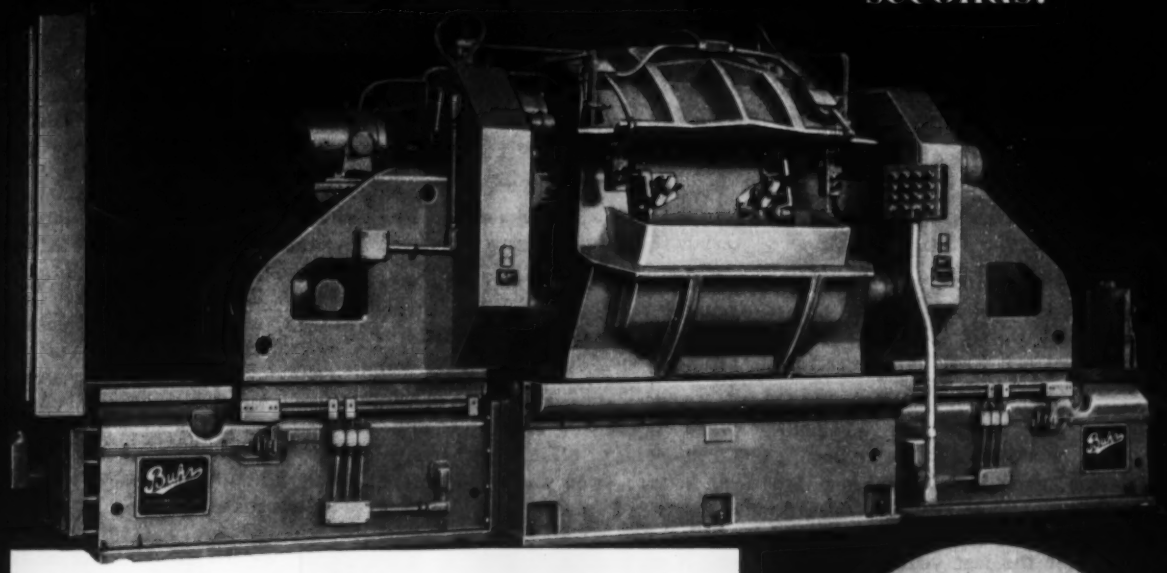
EDGAR D. LEON

. . . head Gear Grinding Machine Co. subsidiaries

Buhr

SPECIAL...

Drills, chamfers and taps two rear axle drive shafts every 22 seconds!



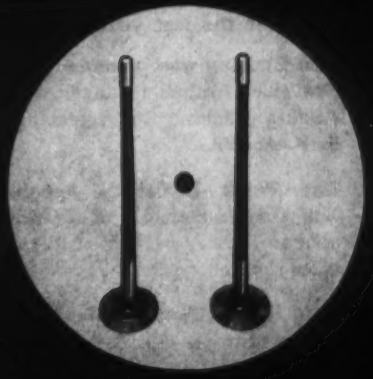
This Trunnion-Type Buhr Special drills, chamfers (both sides of holes) and taps 328 pieces an hour at 100% efficiency.

Two parts are loaded per fixture on this 6-station, 2-way Buhr Special.

Hydraulic clamping-and-unclamping is completely automatic.

Cluster heads — incorporated in a master gear box — are featured, as with all Buhr Trunnion-Type Machines.

On Buhr Specials, all parts are held to tolerances and are completely interchangeable. All component assemblies are located by precision-bored dowels. These Standard Buhr Features assure precision alignment!



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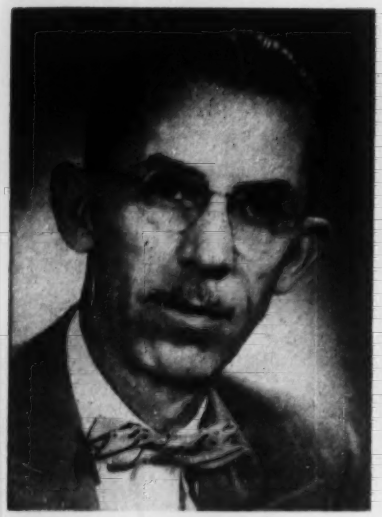
Solidly Engineered . . . Precision Built for World's Leading Manufacturers

Buhr

MULTIPLE-SPINDLE HIGH PRODUCTION



S. G. HAWLEY

D. G. COSTELLO

. . . Willys Motors' works mgr., production mgr.

ern Pennsylvania, western New Jersey, Maryland and Delaware.

Willys Motors Inc., Toledo, O., appointed **S. G. Hawley** works manager and **D. G. Costello** production manager. **F. A. W. Anger** was named chief inspector.

William A. Martin was appointed works manager of **Chrysler Corp.'s** marine and industrial division, Detroit. He has been production manager at the Delaware tank plant for the last year.

Sam Zimring was promoted to San Francisco branch manager, **Victor Adding Machine Co.**, replacing **A. E. Kaiser Jr.**

Gar Wood Industries appointed **Leif Unstad** manager of its Minneapolis factory truck equipment sales branch.

Fred Haight, formerly a design engineer for A. O. Smith Corp., joined **Heil Co.**, Milwaukee, as materials handling engineer.

Howard E. Riordon was appointed general manager, radio and television division, **Sylvania Electric Products Inc.**, Buffalo. He succeeds **John K. McDonough**, resigned.

Ward W. Minkler, formerly Pacific Coast manager of sales and technical service, was named assistant manager of market development of **Titanium Metals Corp. of America**, New York.

Paul Kjelstrom was made manager of the service and parts division of **Verson Allsteel Press Co.**, Chicago.

Donald B. Huntting was made representative in southern Ohio for **Ready Tool Co.** He has offices at Cincinnati.

Clyde LeBeau of Canton, O., was appointed chairman of **Republic Steel Corp.'s** transportation committee. He succeeds the late **George Hackett**, formerly of Republic's Youngstown steel plant.

San-Equip Inc., Syracuse, N. Y., appointed **Arthur S. Schai** assistant to the president-engineering and product development. He is succeeded as manager of the Syracuse plant by **Donald S. Jaquith.**

Fred O. Reemer, vice president in charge of southern sales for **Pullman-Standard Car Mfg. Co.**, Birmingham, has retired. He is succeeded by **R. E. Schooley.**

George H. Brown, past president of American Marketing Association, was appointed consumer research manager, **Ford Division**, Ford Motor Co., Dearborn, Mich.

W. S. Beard, commodity manager, central division, was appointed assistant manager of sales, Atlantic division, **American Can Co.**, New York. He is replaced by **C. W. Curry**, who, in turn, is succeeded by **Alexander Black** as assistant manager-sales, Pacific division.

Fred C. Stockinger was appointed West Coast district manager for **Bay State Abrasive Products Co.**, Westboro, Mass.

T. O. Carroll was transferred from San Francisco to Portland, Oreg., and promoted to district manager by **Soule Steel Co.**

Bucyrus-Erie Co., Milwaukee, appointed **Lawrence E. MacDonald** general sales manager in charge of all domestic sales.

E. J. Williams was promoted to senior production engineer at **Dow Chemical Co.'s** Freeport, Tex., magnesium plant.

OBITUARIES . . .

John M. Ivory, executive vice president, **Hunter-Douglas Corp.**, Riverside, Calif., was killed in an airplane crash in Oklahoma Oct. 7.

George E. Gasser, 56, purchasing director, **Binks Mfg. Co.**, Chicago, died Oct. 9.

H. Brooks Hatton, 68, sales engineer covering Youngstown, Chicago and Cleveland areas for **Mackintosh-Hemphill Co.**, Pittsburgh, died Oct. 4.

Eugene C. Phillips, 68, assistant general sales manager, **Pettibone-Mulliken Corp.**, Chicago, died Oct. 9.

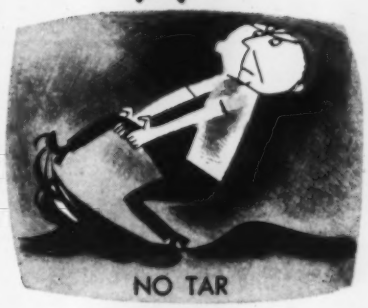
Gilbert H. Turner, 48, director of industrial relations for **Timken Roller Bearing Co.**, Canton, O., since 1948, died Oct. 9.

Robert T. Elliott, 45, sales manager, Shear Knife Division, **Universal-Cyclops Steel Corp.**, Bridgeville, Pa., died Oct. 6.

Ward E. Pratt, 64, chemical consultant of **Worthington Corp.'s** centrifugal pump division, died at his home in West Orange, N. J., Oct. 5.

Lute C. Hornickel, 57, supervisor of personnel for U. S. Steel Corp.'s **American Steel & Wire Division**, Cleveland, died Oct. 11.

Only the Wiggins Gasholder*



has the dry fabric seal that

eliminates maintenance problems!

Write for information

WIGGINS VAPOR SEALS
GENERAL AMERICAN
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GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South La Salle Street
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*PATENTED

Here it is—

THE NEW HANSEN SERIES 3-RL

QUICK-CONNECTIVE RING-LOCK COUPLING

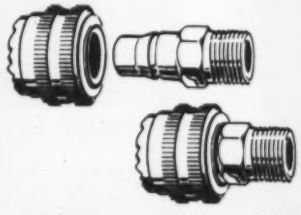
Relative size of ordinary coupling required for effective handling of same volume

Effectively handles far more volume than any coupling of equal dimensions

Tough, compact, smaller, the new Hansen Series 3-RL Coupling will handle any job in your shop using ¾" to ⅛" connections—from the air line to the air tool. No longer is there any need for various sizes of couplings at different points in your hook-up. The Hansen Series 3-RL, with completely interchangeable sockets and plugs does it all—makes it easy to keep stock of parts in balance—holds inventories to a minimum.

Carefully designed, the Hansen Series 3-RL combines maximum flow with compact construction. Sockets are brass with steel sleeves—plugs are steel. Sockets for use with small hand-operated air tools are available in aluminum.

Write for Descriptive Literature



POSITIVE LOCKING

Ring Lock Provides Practically 360° Metal to Metal Contact

• Equipped with automatic sleeve lock, the Hansen Series 3-RL Coupling is quickly and positively connected merely by pushing plug into socket. To disconnect, just turn the sleeve. Locking ring in socket is forced into groove in plug, provides practically 360° metal to metal contact, reduces wear, and insures tight fit.

THE HANSEN MANUFACTURING COMPANY

4031 WEST 150th STREET • CLEVELAND 11, OHIO

Kaiser Gets Forging Plant

Will enlarge Erie facility as supplier of aircraft, ordnance and commercial forgings

ACQUISITION of a forging plant at Erie, Pa., by Kaiser Aluminum & Chemical Corp., Oakland, Calif., will result in further expansion and diversification of the company in the aluminum mill products field.

The Erie plant, leased from General Services Administration for a period of up to 20 years, contains 346,000 sq ft. Its production facilities include die producing and heat-treating facilities, as well as drop hammers and presses.

It can produce aluminum die forgings up to 150 lb and has a rated annual capacity of 12 to 15 million lb of forgings. Currently, it is producing forged aircraft and ordnance parts. The Erie plant was built by the government during World War II, representing an investment of about $9.5 million.

Wider Service—Kaiser plans to continue present operations of the plant and to develop and enlarge its services in the future. The Erie works will be under the general supervision of J. T. Dugall, manager of the Newark, O., rod, bar, wire and electrical conductor plant. The latter facility is an important producer of forging stock and will supply the Erie facility.

Kaiser Aluminum announced recently that construction will start about Jan. 1 on a multimillion-dollar aluminum sheet and foil rolling mill on the Ohio river near Ravenswood, W. Va. The Erie and Ravenswood plants will be the tenth and eleventh major aluminum facilities in the company's completely integrated "ore-to-product" operations. Expansion in the past three years has increased Kaiser's capacity to close to 30 per cent of the primary aluminum produced in the United States, says D. A. Rhoades, vice president and general manager.

Magnecord Buys Davies Firm

Magnecord Inc., Chicago, maker of magnetic tape equipment, purchased Davies Laboratories Inc., Riverdale, Md., radio and electronic firm. Both companies retain their corporate entities.

Chem'ray Inc. Organized

Industry in northeastern Ohio has a new scientific service organization, providing x-ray analysis of castings and weldments. The firm, Chem'ray Inc., opened headquarters at 22290 Lakeland Blvd., Euclid, O. Its staff is headed by Edward Haylett.

Sheet Aluminum To Expand

Mueller Brass Co., Port Huron, Mich., plans to expand operations of its recently acquired subsidiary, Sheet Aluminum Corp. New, high-speed equipment will be installed soon.

Navy To Buy Heavy Machinery

A $5-million contract for procurement and installation of special purpose heavy machinery by Reynolds Metals Co. has been approved by the Navy. Machinery includes a 15-million lb capacity aluminum plate stretch leveler to be installed at the company's McCook, Ill., plant; two large aluminum skin milling machines for the McCook plant; and a 6000-ton extrusion press for the Reynolds plant at Phoenix, Ariz.

The Navy will retain ownership of the machinery, which is to be used only for government contract work in the fabrication of wing panels and other large single piece structural parts for jet aircraft. Two other skin mills for the McCook plant were contracted for in 1953 and are scheduled for delivery in the near future.

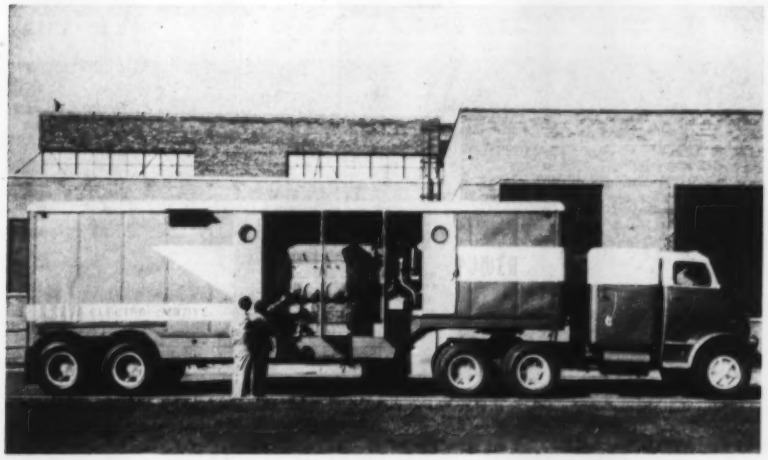
Gramm Plans Consolidation

Gramm Trailer Corp. plans to sell its plant in Wapakoneta, O., as part of an over-all program to concentrate operations in Delphos, O. General offices would be moved to Delphos from Lima, O.

Firms Enter Joint Venture

Seidelhuber Iron & Bronze Works Inc. and Pacific Steel Rolling Mills Inc., Seattle, made a joint purchase of land and a building with 30,000 sq ft of floor space at Colorado and Hinds street, that city. The building will house the offices and manufacturing operations of the two companies. Seidelhuber Iron & Bronze produces miscellaneous iron, steel, bronze and aluminum metalwork for the building

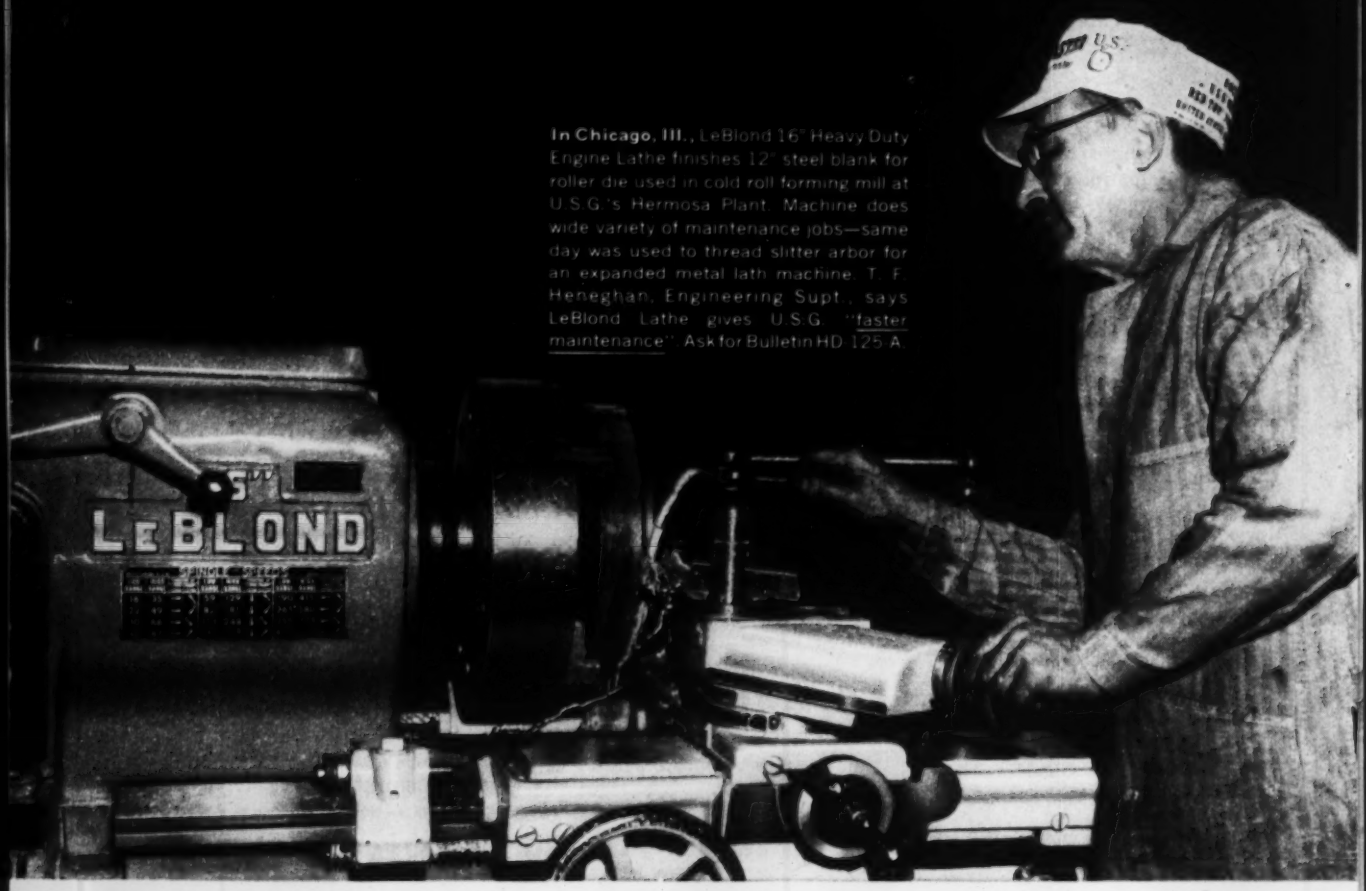
(*Please turn to page* 122)



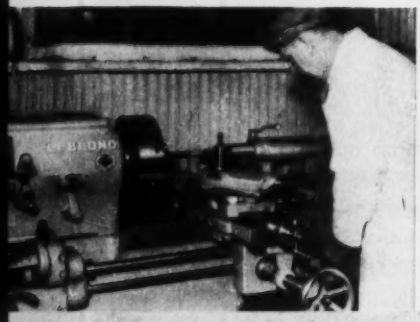
GM Designs Mobile Electric Power Generating Plant

General Motors Corp.'s Electro-Motive Division has developed a mobile electric power generating plant. It'll help utilities protect and improve service to customers in outlying areas and meet emergency conditions. Three models (500, 750 and 1000-kw capacity) are designed to be moved over railroads; two models (350 and 500-kw capacity), over highways. Doors are open to show the 500-kw model's prime mover, an 800-hp diesel engine. The units may be coupled together to form highway fleets or long trains to obtain the capacity called for

Versatile LeBlond Lathes Knock Down

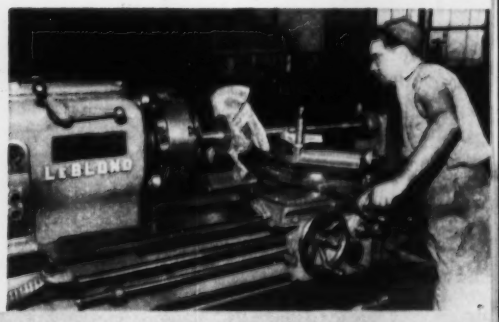


In Chicago, Ill., LeBlond 16" Heavy Duty Engine Lathe finishes 12" steel blank for roller die used in cold roll forming mill at U.S.G.'s Hermosa Plant. Machine does wide variety of maintenance jobs—same day was used to thread slitter arbor for an expanded metal lath machine. T. F. Heneghan, Engineering Supt., says LeBlond Lathe gives U.S.G. "faster maintenance". Ask for Bulletin HD-125-A.



In Norfolk, Va. versatile LeBlond 19" Regal Gap Lathe recuts welded boot scraper shaft. Exacting precision is number one requirement here. Note removable bed section is in place on this job, can be removed to accommodate work up to 27¼" diameter. Ask for Bulletin R-PG-1-A.

In Ft. Dodge, Iowa, LeBlond 17" Regal Lathe bores sprocket to ±.001". Sprocket must fit bearing shaft also turned on the LeBlond. Plant Engineer, John F. Hoertz, says, "This lathe holds tolerances better than previous lathes, saves tool life, speeds up maintenance work . . . ". Ask for Bulletin R-135-A.



In Greenville, Miss., LeBlond 16" Heavy Duty Engine Lathe dresses down shaft for flume return pump, part of the water return system at U.S.G.'s Pressed Board Plant. Other jobs include machining precision bearings for Pelton pump, turning down built-up bushing on universal joint for a steam press—typical of the great variety of turning work now done in U.S.G.'s own shops. Many used to be jobbed out, cost extra time and money. Ask for Bulletin HD-125-A.

"Upkeep" Costs for U.S. Gypsum

16 U.S.G. Plants from Maine to California

depend on LeBlonds for speedy, economical maintenance.

Dozens of turning jobs that used to be "farmed out" by U.S. Gypsum Plants now get done at less cost and *days sooner*, right in U.S.G.'s own maintenance shops—thanks to versatile LeBlond Lathes.

With U.S.G.'s quarry-to-finished-product operation, plant machinery ranges from huge mining equipment—to processing machinery—to speedy conveyors—to intricate packaging machines that bundle up finished products. Who knows what the LeBlond's next "fix-it" turning job will be? Today it's dressing down the shaft of a flume return pump. Tomorrow it's finishing a precision bearing where the critical tolerance goes down to tenths!

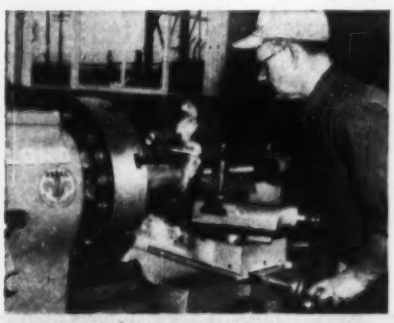
Convenience, low cost, dependability, wide variety of work—that's what LeBlond Lathes mean to maintenance men at U.S. Gypsum. And that's why there's at least one LeBlond Lathe on maintenance work in each of 16 U.S.G. Plants—from Maine to California.

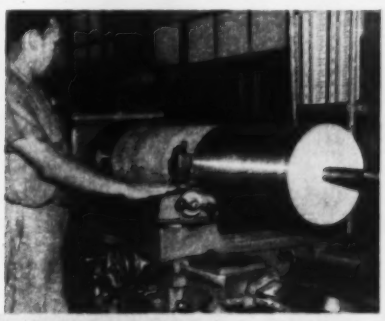
How many of *your* turning jobs did you send out of your plant this month? Is the "other fellow's" profit a large chunk of your maintenance cost?

Call your nearby LeBlond Distributor. Show him the variety of turning work that your maintenance requires. Tell him how long it takes to get it done elsewhere, what it costs. From LeBlond's complete line of 76 different lathe models, he can recommend lathes that will handle all of it—or at least a major portion. You'll get the work done sooner, dependably, and without an outsider's profit to pay for.

For complete information contact your LeBlond distributor or write

THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO



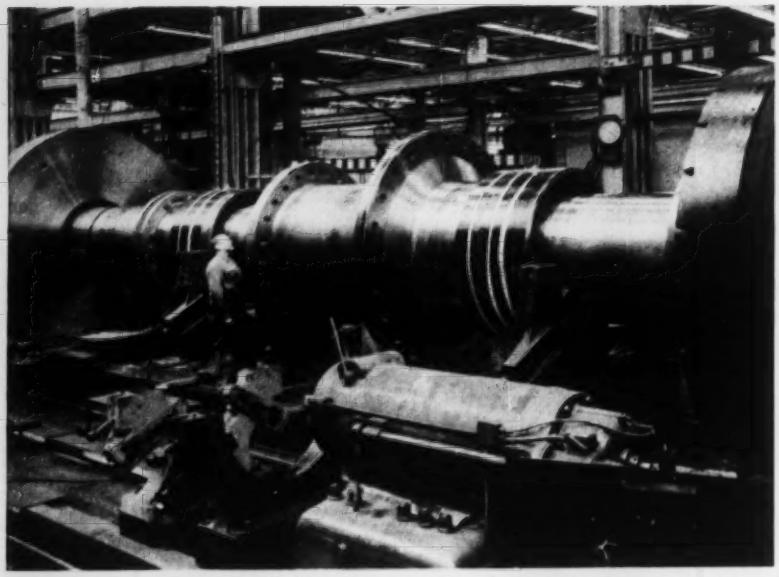


LeBLOND of Cincinnati

In Alabaster, Mich., LeBlond 24" Regal Lathe threads take-up bolt for 4½ yard Bucyrus-Erie Rock Shovel. Four threads per inch, speed 95 rpm. Plant Engineer, E. John Minderman, says this LeBlond Lathe handles work ranging "from very small parts found in electrical and hydraulic equipment to large gears, shafts and armatures that require the full capacity of the machine". Reports "very dependable service". Ask for Bulletin R-163-A.

In Plaster City, Calif., U.S.G. saves at least seven days by machining this roller on the LeBlond 20" Standard Duty Engine Lathe—right in their own shop. Job used to be sent out, took up to ten days to complete. Another LeBlond Lathe is still in regular use at the Plaster City Plant, after over 25 years of maintenance work. Plant Engineer, R. W. Langewisch, says LeBlond Lathes "save time, expense, increase shop capacity". Ask for Bulletin SD-250-A.

World's largest builder of a Complete Line of Lathes—for More than 66 Years.



McNary Dam Powermaker Shaft Is Readied

This 118-ton shaft assembly being machined at General Electric Co.'s large motor & generator department, Schenectady, N. Y., is for one of 12 hydraulic turbine-driven generators GE is building for the McNary Dam on the Columbia river. Each of the powermakers is 52 feet in diameter and weighs 1200 tons

(*Concluded from page* 119)
trades; Pacific Steel, small size steel bars. Officers of both companies are Frank V. Seidelhuber Jr., president; Frank J. Seidelhuber and Henry R. Seidelhuber, vice presidents.

Mercast To Build in California

Mercast Corp., an affiliate of Atlas Corp., New York, plans to build a plant in LaVerne, Calif. The facilities, expected to be in full operation early in 1955, will total 12,500 sq ft. The firm controls rights for the Mercast process, which uses frozen mercury for the production of expendable patterns for the manufacture of investment castings.

Bowser Gets West Coast Outlet

American Pipe & Steel Corp., Alhambra, Calif., will manufacture for West Coast distribution several products fabricated by Bowser Inc.'s subsidiaries in Ft. Wayne, Ind., and Cairo, Ill. The products include heavy tanks, weighing up to 15,000 lb; dehydrators, weighing up to 4000 lb; and patented smokeless incinerators. Bowser Inc., Chicago, is the parent company of 20 subsidiaries, most of them in the industrial products manufacturing field.

Otis To Buy Baker-Raulang

Otis Elevator Co., New York, will purchase Baker-Raulang Co. and its subsidiary, Baker-Lull Corp., Cleveland, subject to approval by Baker-Raulang stockholders. The sale has been approved by directors of both companies. The Cleveland firm makes a diversified line of materials handling equipment, ranging from fork trucks to newly developed side-loading trucks.

O'Neal Enlarges Warehouse

O'Neal Steel Co. built an addition to its warehouse in Birmingham. It'll handle special items of alloy steel. Representing an investment of $60,000, it will be ready for operation late in October.

Steber Opens California Unit

Steber Mfg. Co., Broadview, Ill., maker of floodlighting equipment. organized Steber Mfg. Co. of California. Manufacturing facilities are at 242 S. Anderson St., Los Angeles 33. John Kresich is sales manager. Paul Waterbury is special sales representative and lighting specialist.

Machinery Maker Expanding

Samuel M. Langston Co. is building a $250,000 addition to its Camden, N. J., plant. This maker of corrugated and boxmaking machinery recently completed a $1-million addition to its manufacturing facilities. It subcontracted, with an original $480,000 order, the manufacture of its shaftless mill roll stands to Fayscott Co., Dexter, Me. Other changes, all designed to speed up production, include the transfer of its foreign business to Masson Scott Co. Ltd., London, England, and the disposal of its tube winding equipment to provide more floor space to produce its corrugating machines.

Morris Licenses Canadian Firm

Morris Machine Tool Co., Cincinnati, licensed John Bertram & Sons Co. Ltd., Dundas, Ont., to manufacture its Mor-Speed special production equipment in Canada. Design and engineering work on the special machines will continue to be done by Morris Machine Tool. Bertram makes more than 75 different types of machines. Its separate Metal Cutting Tool Division produces more than 20,000 types of cutting tools, gages and special small tools. In addition to the Mor-Speed line of machinery, Morris builds 9 and 11-in. radial drills and several models of an automatic piston balancing machine.

Huge Dredge Launched

A dredge, claimed to be one of the largest ever built, was launched at Falls Bay, Steep Rock Lake, Atikokan, Ont. Christened the *Joseph L. Block,* she is the sister dredge to the *Clarence B. Randall,* previously launched at this location. Built by Construction Aggregates Corp., Chicago, dredges will be operated by that firm for Calend Ore Co. Ltd., a subsidiary of Inland Steel Co., Chicago.

The dredges will remove about 160 million cu yd of silt overburden from the basin of Falls Bay. This is equivalent to an excavation 3 miles long by 1 mile wide by a

(*Please turn to page* 125)

NOW— *from Borg-Warner's centrally located Ingersoll Steel Division, at New Castle, Indiana...*

FORGING QUALITY

INGOTS

UP TO

23,000 POUNDS

to your own analysis

If you've been looking for a dependable source for ingots of superior forging quality, it will pay you well to see how Ingersoll can serve you with:

- **Electric furnace carbon steel or alloy grades to your own analysis and specifications.**
- **Ingots in any size and shape from 400 pounds to 23,000 pounds.**
- **Great flexibility in production schedules—set up to fit in with your own forging requirements.**
- **Ample capacity to meet your needs . . . on schedule.**
- **The assurance of uniform high quality from one heat to the next.**

FOR FULL DETAILS—WRITE, WIRE OR PHONE—NOW

ENGINEERING B-W PRODUCTION

Ingersoll

STEEL DIVISION

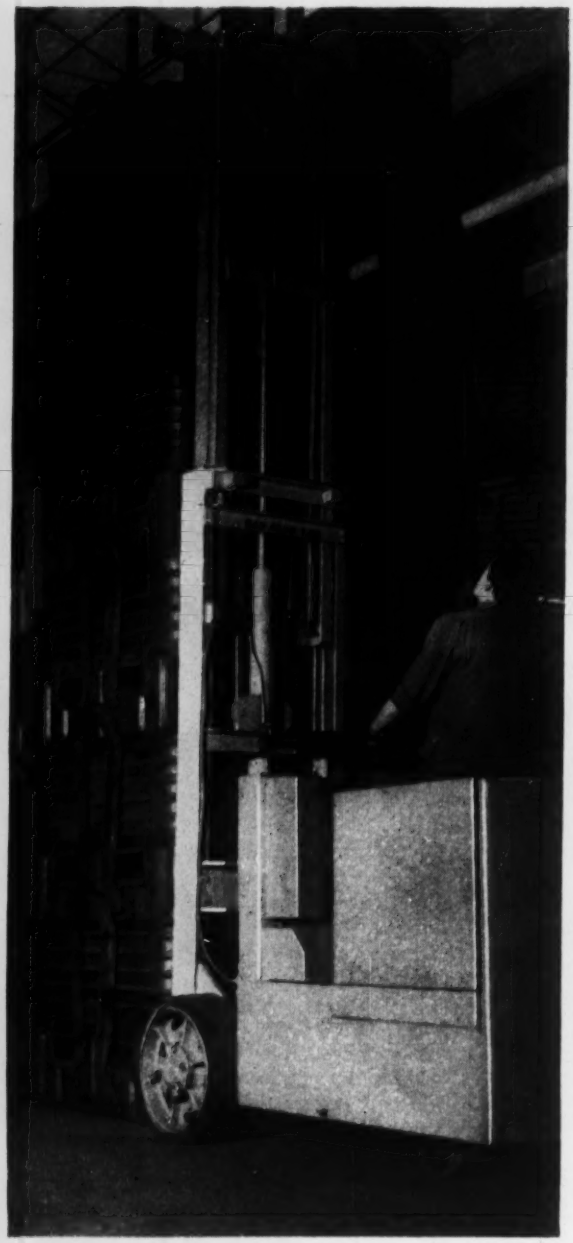
Borg-Warner Corporation

New Castle, Indiana

alloy steels • armor plate • carbon electric steel for tank clutch discs • clutch plate steels • heat-resisting steels • IngAclad stainless-clad steel • knife steels saw steels, including high speed hack saw blade steels shovel steels • soft center steel • stainless steels Tem-Cross cross-rolled steel • tillage steels.

GET "FINGER-TIP" CONTROL, MORE LIFTS PER SHIFT

. . . with low cost Exide-Ironclad battery power!



ACCURATE STACKING, precise spotting, are essential for fast, safe materials handling. Exide-Ironclad Batteries respond instantly to any power need required for rapid, accurate handling operations. They enable trucks to handle as much load in the last hour of the shift as during the first . . . with no unscheduled down time. Lower costs for operation, maintenance, and depreciation make Exide-Ironclads the best power buy—AT ANY PRICE.

THE POSITIVE PLATES are the heart of any battery. Only Exide uses a slotted tube construction. By use of tubes, more active material is exposed to the electrolyte, providing *greater power.* Also, more active material is retained, *giving longer working life.*

THE NEW THRIFTY HAULER! The improved industrial truck battery. *Non-oxidizing* plastic power tubes assure longest battery life, more capacity in the same space. For full details, call your Exide sales engineer—write for Form 1982 (Installation and Maintenance of Motive Power).

Your best power buy
. . . AT ANY PRICE!

Exide®
IRONCLAD® BATTERIES

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

(*Concluded from page* 122)

depth of 400 ft. This approaches the volume of the dredging operation for the Panama Canal. Each dredge is expected to move the material at a rate of 5000 cu yd per hour, 3 million cu yd per month.

Kaiser Opens Phoenix Branch

Kaiser Steel Corp., Oakland, Calif., opened a sales office in Phoenix, Ariz. It's under the direction of John C. Mackey.

Symington-Gould To Diversify

Symington-Gould Corp., Depew, N. Y., plans to diversify production to reduce dependency on railway equipment business. Two electric melting furnaces, installed at a cost of about $200,000, will expand facilities of the plant to include production of steel castings of various alloys and intricate shapes. The new line will supplement existing manufacture of railroad castings and ordnance items.

Electronic Tubemaker Expands

Radiophone Co., wholly owned subsidiary of Northrop Aircraft Inc., Hawthorne, Calif., opened a 10,000-sq-ft facility in Monrovia, Calif., for increased production of electronic tubes.

Appliance Maker To Build

Eastern Metal Products Corp., Tuckahoe, N. Y., household appliance manufacturer, will build a 350,000-sq-ft plant in Ft. Smith, Ark. Production will include a number of new major items in addition to the present line of electric skillets, deep-fryers, roasters, rotisseries, electric dry irons, steam irons, pressure cookers and cooking utensils.

Mullins Plans To Buy Schaible

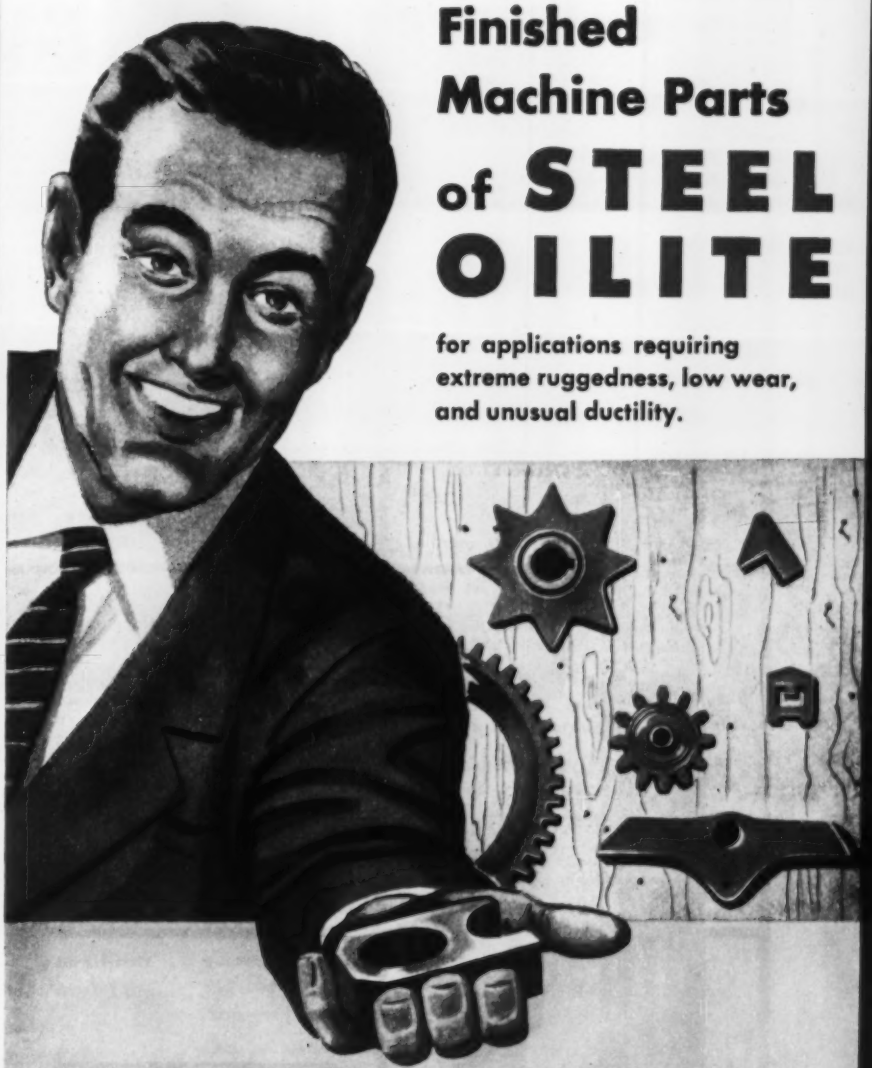
Mullins Mfg. Corp., Salem, O., plans to acquire Schaible Co., Cincinnati, manufacturer of valves, cocks, drains, sinks and lavatory trim. Schaible will be operated as a wholly owned subsidiary and will devote part of its facilities to the production of small cold extrusions

(*Please turn to page* 128)

NOW... Another Chrysler First!

Finished Machine Parts of STEEL OILITE

for applications requiring extreme ruggedness, low wear, and unusual ductility.



If you've passed up using metal powder finished machine parts because your applications require units of greater strength and ductility than they normally provide, then you will want to investigate STEEL OILITE.

Here is a new, yet thoroughly proved, metal powder product that is saving users from 35% to as high as 96% over conventionally produced precision finished machine parts

STEEL OILITE Finished Machine Parts provide revolutionary new strength and ductility that makes these big savings practical on countless new applications where component parts need to be especially tough.

Write today for the New Bulletin on STEEL OILITE just published. It's yours for the asking. Please request Bulletin STM-54.

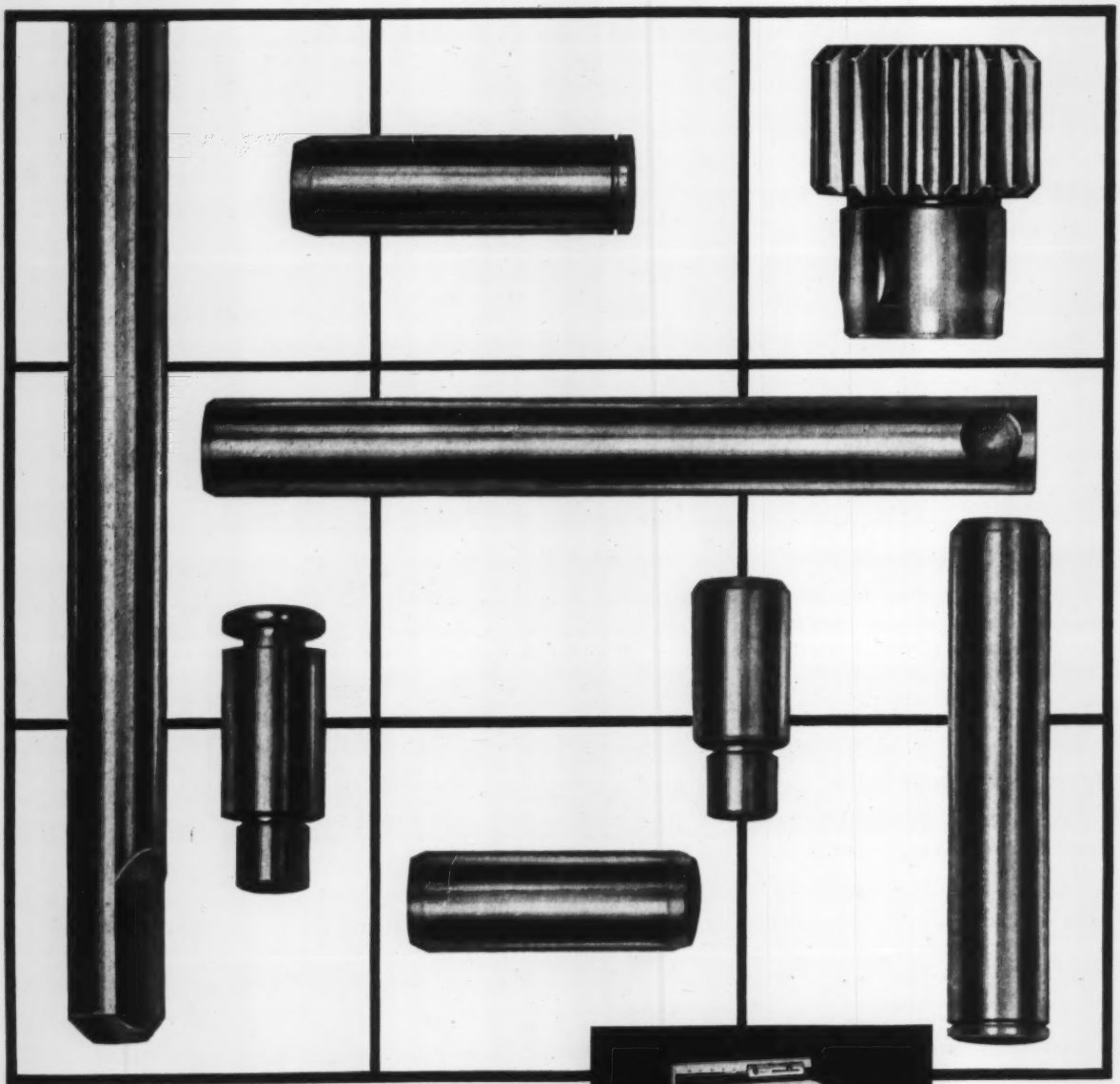
A CHRYSLER OILITE PRODUCT

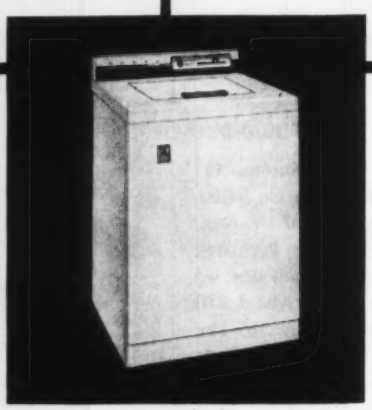
CHRYSLER CORPORATION
AMPLEX DIVISION
Dept. A Detroit 31, Mich.

FIELD ENGINEERS THROUGHOUT THE UNITED STATES AND CANADA

OILITE PRODUCTS INCLUDE: Bearings, Finished Machine Parts, Cored and Solid Bars, Permanent Filters and Special Units of Non-Ferrous and Ferrous Metals and Alloys including Stainless Steel.

How Norge





The parts above are made from Republic Cold Drawn Carbon Corrected Bars. They are used in the top-rated Norge Automatic Washer, Model AW450, manufactured by the Norge Division of Borg-Warner Corporation.

reduced costs 16%

with

REPUBLIC COLD DRAWN CARBON CORRECTED BARS

These parts go into the new Norge Automatic Washer, Model AW 450. They were being made from C-1117 Cold Drawn Steel. Production on the parts was good. But, they had to be trucked to a nearby city for carburizing. This increased unit cost.

Republic Metallurgical Service was asked for advice on how to cut unit cost and still maintain production. After careful consideration of all factors, a switch to Republic Cold Drawn Carbon Corrected Steel was recommended.

Machining and tooling alterations were worked out through close cooperation between Norge Engineers and a Republic Machining Specialist.

Here are the benefits Norge is receiving as a direct result of switching to Republic Cold Drawn Carbon Corrected Bars:

1. The costly carburizing operation has been eliminated.
2. They are getting better machinability.
3. The quality of the parts has been improved.
4. Unit costs have been reduced 16%.

WHAT IS CARBON CORRECTION AND HOW CAN IT HELP YOU?

Carbon correction is the restoration of carbon lost from the bar surface during hot rolling. This lost carbon is restored right out to the edge of the bar through annealing in a controlled carbon-rich atmosphere prior to cold drawing.

Carbon Corrected Bars are ideally suited for your steel parts which must have high surface hardness —particularly those produced by both high and low frequency induction heating.

Using Republic Cold Drawn Carbon Corrected Bars eliminates waste, both in metal and money. It's not necessary to machine or grind away the surface to remove "decarb". You eliminate buying bars oversize to allow for surface removal. You get better MACHINABILITY.

Our metallurgists and machining specialists are ready to help you use Republic Cold Drawn Carbon Corrected Bars to the best advantage.

Call your nearby Republic District Sales Office.

REPUBLIC STEEL CORPORATION

Union Drawn Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, New York

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REPUBLIC STEEL

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(*Concluded from page* 125)

and other items for Mullins. Mullins also announced plans to erect a 105,000-sq-ft addition to its warehouse in Warren.

REPRESENTATIVES

Allis-Chalmers Mfg. Co., Milwaukee, appointed Valley Electric Co., Stockton, Calif., as a distributor of its transformers. The firm also named Trester Service Electric Co. Inc., Milwaukee, as a certified service shop for its motors and control equipment in southeastern Wisconsin.

Detroit Broach Co., Detroit, appointed Production Service Co., Cleveland, its representative in northeastern Ohio.

Garrett Corp.'s Airsupply Co., Beverly Hills, Calif., has been appointed exclusive representative for **Kwikset Powdered Metal Products**, Anaheim, Calif.

Clary Multiplier Corp., San Gabriel, Calif., and **Avron Corp.**, Long Beach, Calif., concluded arrangements under which Clary's Aircraft Division will act as manufacturer's agent and handle domestic and export sales of Avron products for the aircraft industry. Avron manufactures valve and assembly units for aircraft hydraulic fuel and pneumatic uses and makes a standard line of aircraft products for general application. Clary manufactures business machines, electronic equipment and automatic control precision instruments and is a supplier of aircraft pulleys, universal joints and other hardware items.

American Gage & Machine Co.'s division, **Size Control Co.**, and its Wacker Sales, Chicago, were appointed exclusive agents for the line of portable hardness testers manufactured by **Riehle Testing Machines**, a division of **American Machine & Metals Inc.**, East Moline, Ill. Size Control Co. also represents B. C. Ames Co., Waltham, Mass.; Webber Gage Co., Cleveland; Rahn Granite Surface Plate Co., Dayton, O.; Boice Mfg. Co., Staatsburg, N. Y.; Tubular Mi-

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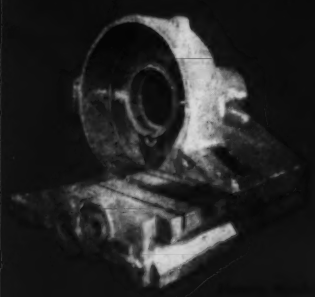

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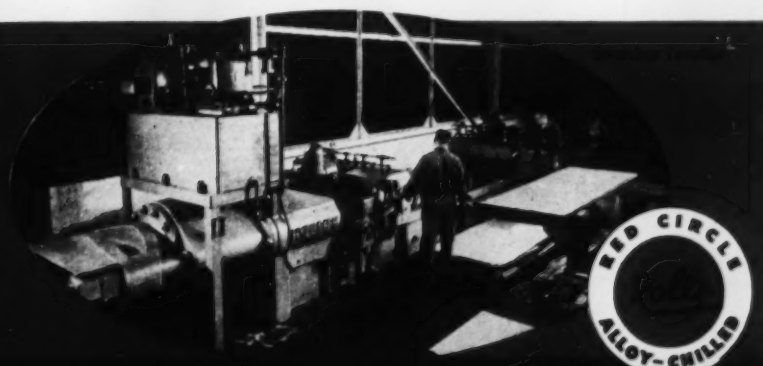

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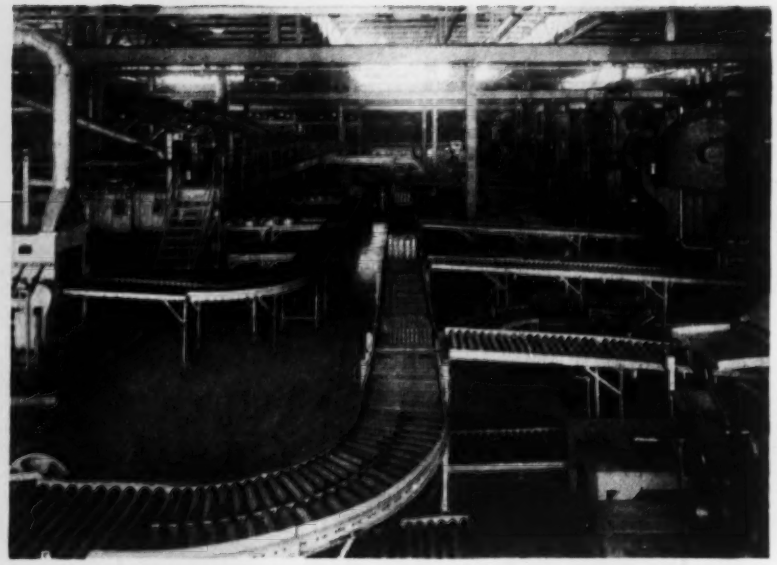

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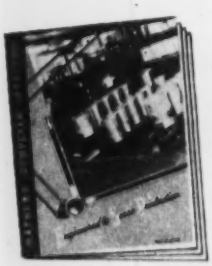

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crometer Co., St. James, Minn.; Merz Engineering Co., Indianapolis; and others.

Elwell - Parker Electric Co., Cleveland, appointed Landes, Zachary & Peterson Co., Denver, as a distributor of its industrial trucks.

American Drill Bushing Co., Los Angeles, appointed Kurt Orban Canada Ltd., Toronto, Ont., as its distributor in Canada.

Detroit Steel Corp., Detroit, appointed Frank Edelman as sales representative, New York district sales office, New York, and assigned Albert A. Breuel Jr. as sales representative to the corporation's New Haven district sales office, Hamden, Conn.

Kaiser Aluminum & Chemical Corp., Oakland, Calif., appointed Steel & Aluminum Products Corp., Detroit, a distributor of its aluminum sheet, plate, rod, bar and wire.

NEW ADDRESSES

Rhode Island Nickel Plating Co. moved to Industrial Park building, Warwick, R. I. The company had operated a plating shop in Providence, R. I., since 1870, but was flooded out by a hurricane early this fall.

A. O. Smith Corp., Milwaukee, will move its Dayton, O., operations to a building being constructed at 227-231 E. Helena St. The move is scheduled to be made in February.

Electro Development Co., manufacturer of slip rings and brush holder assemblies for the electronics industry, moved to 14701 Keswick St., Van Nuys, Calif.

Basco Inc. and **E. V. Nielsen Inc.**, sales agents for Basco sheet steel separators, moved their manufacturing, sales and warehousing and display facilities to 128 Broad St., Stamford, Conn. In a previous item, it was incorrectly stated that Bass & Co. Inc. was making the move with Nielsen. The latter firm maintains its headquarters at 50 Broad St., New York.

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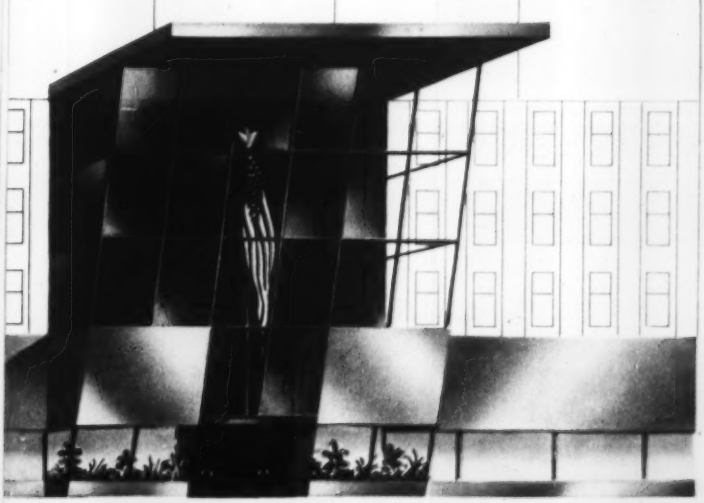

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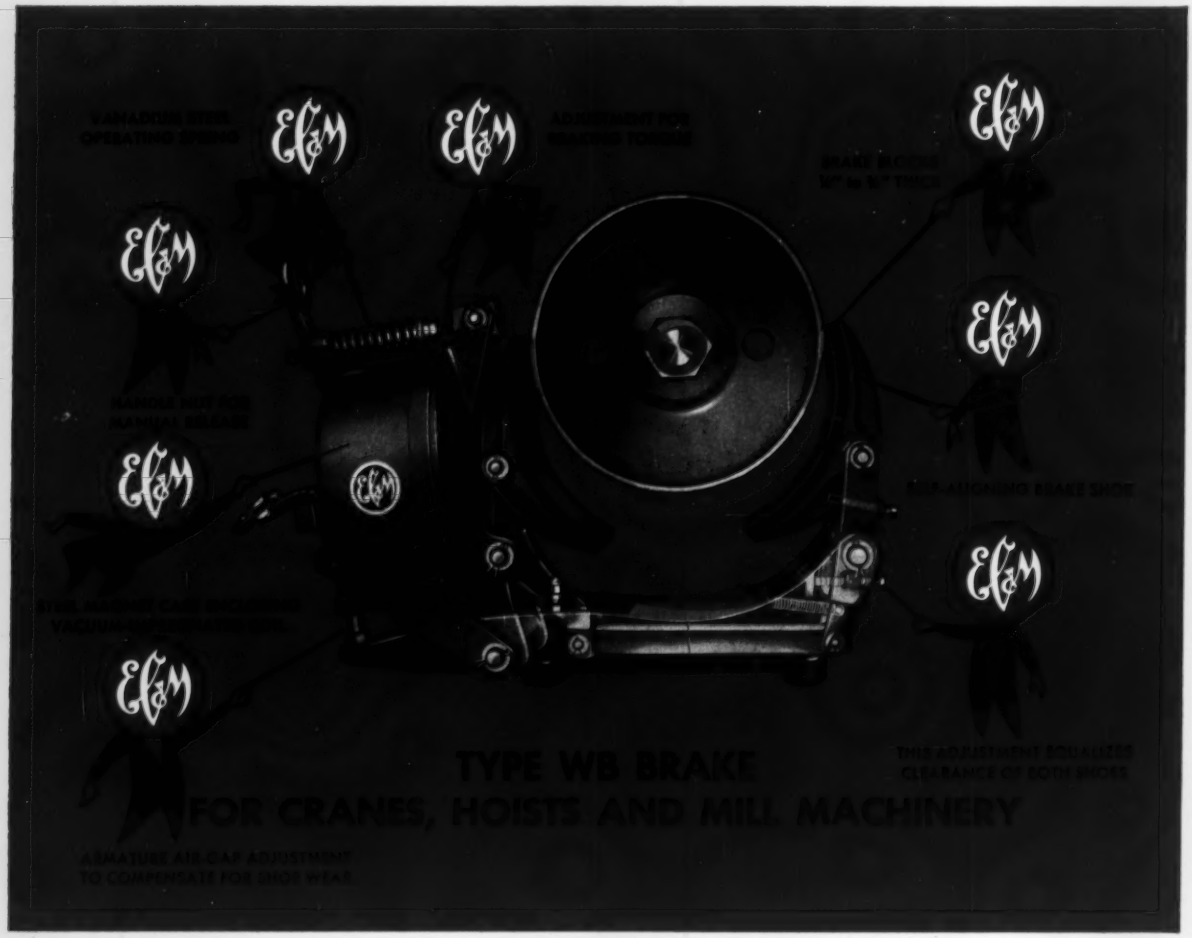

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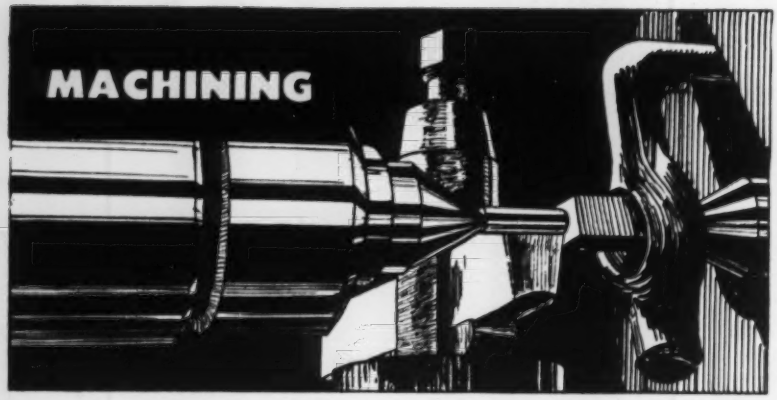


Watch for more automation . . . faster speeds . . . better tools . . . tracer controls . . .

ODDS ARE about 9 to 1 you can save money by re-examining machining jobs in your plant, by using revised tooling ideas, higher speeds, heavier feeds, proper cutting fluids.

While you will probably find many jobs are already running in high gear, just about every plant in the country is doing some machining at less than peak efficiency.

On the Move—New tool materials have completely changed the concepts of how fast you can cut. Take a look at the studies on the science of metalcutting. They can give you more information on higher cutting speeds and feeds, proved tools shapes for many cutting conditions, etc.

In short, old ideas are being replaced so rapidly that to stand pat technologically is to lose ground competitively.

Prime Example—A glimpse at cutting speeds alone will point up the changing picture in metalcutting. You'll find the free-machining steels that were cut at 250 to 300 sfm are now cut at 400 to 1000 sfm on the same operations.

Machine builders are tooling up jobs every day, recommending the higher cutting speeds as standard practice. Naturally, the speed you choose for a job will depend on its economics (labor, tool life, production requirements, etc.). The important thing to know is that increased speeds are not only possible but practical—use them if you can.

Target — Automation has been highly touted as an across-the-board trend. Certainly, more operations in a widening circle of plants will be automated. In addition to the now-standard mechanization of work handling, look for automated tooling adjustments.

Gaging devices, already part and parcel of the production line, will be tied back to the tool responsible for the dimension checked. They will adjust tool performance (say, depth of drill stroke) to keep it producing within limits. It's now being done on grinding.

Programmed tool changes with preset tools, automatic chip removal, centralized coolant systems, etc., all lead to reduced machine downtime. It's a way to get more productivity per machine—greater dollar return per unit time.

Long Arm—An interesting development in automation is its extension into small operations and standard machines. The idea is to reduce total cycle time vs. actual cutting time.

You can cut this ratio with automatic machines, automatic loading, unloading and positioning devices, faster starting and stopping and rapid speed change. While you may have to get new equipment to get in on the ground floor here, you can keep the gimmicks in mind for existing equipment — adding hopper feeds, power chucks, or preset tools where you need them.

On Automatic—Don't overlook the possibility of applying tracer controls to some of your machines. They can cut as much as 80 per cent from machine handling time and may substantially improve the uniformity of the product they turn out.

When you think of contouring, don't limit your thinking to turning. It can also be applied to milling, shaping, boring, etc. Along with this goes the multiple-wheel setups on grinding machines, where you can grind multiple diameters, flanges, shoulders and faces on one setup.

New Machines—If you're a buyer of standard machines, keep tabs on what machine tool builders are doing to redesign their products. You're in for some favored treatment.

For the first time in nearly 15 years, machine tool builders have a chance to sit back and re-examine their products. They're making wholesale engineering improvement that will bring faster floor-to-floor time and lower unit cost to your shop.

Look For—Sure bets for wide application on newly designed machines will be higher horsepower, greater rigidity throughout, faster speeds and feeds and more automatic controls. Things you did by pulling levers will be done by pushing buttons. Case in point is the switch to pushbutton shifting of spindle speeds on some of the newer lathes.

Also expect more precision controls, such as optical setting devices, which will give you top precision where you need it.

Check The Metal—Even the metallurgists are getting into the act. Their contribution is focused on friction reduction in your workpiece material. Agents they generally use in steels to improve machinability are sulphur, lead and phosphorus.

Bessemer screw stock, sulphurized or phosphorized, was the standard free-machining steel for years. Now, the same steels are being made in the open hearth. Steelmen claim the open-hearth process lends itself to better control and, thus, to improved uniformity. You should be able to get

better steels more often for easier machining.

Addition of lead to steel (see Special Reports, p. 150 and p. 159) appears to boost machinability without altering other properties. Long used in the nonferrous metals, lead is a relative stranger to steel—but it's a comer. Keep tabs on jobs where these premium steels will pay off with reduced costs.

Double Up — Another point on the efficiency checklist should be the combining of operations. When possible, multiple tooling should be standard.

Or even better, you can sometimes combine dissimilar operations on one machine. Take milling on an automatic screw machine. More recent induction hardening during the machining cycle is another. Both eliminate a separate operation, cut handling costs.

New Methods — Resistance of hard-to-cut metals to machining, such as carbide, has led to several new concepts. They include electro machining, ultrasonic machining and electrolytic grinding. While you may not be able to use any of them today, watch them.

Electrolytic grinding shows immediate promise as a way to grind tools. As harder steel alloys, titanium and others, come along, this method is bound to broaden its base of operations. Future uses may also grow out of a partnership with electro machining. Increased grinding speeds seem sure to result.

Specials—Electro machining and ultrasonic machining both have a limited field of application now. Both will pierce holes in extremely hard materials. Ultrasonic machining so far has been limited almost entirely to piercing holes in carbides.

One of the most important uses has been the drilling of tungsten carbide drawing dies, especially where the shape of the holes is complex. Savings up to $85 a die have been cited. Look for this method to spread to other operations, such as shaping, routing and milling.

Electro machining (high-voltage current disintegrates the metal) will compete with ultrasonic machining on some jobs, will complement it on others. It is the faster of the two, but leaves a rougher finish.

All these methods will continue to be limited, but they'll do jobs you can't do any other way.

The Challenge—In these days when a fraction of a cent per part can spell success or mere survival, your machining methods and practice dare not be obsolete, any more than can your equipment. With the accelerated evolution now working in machining methods, the challenge is to keep up.

Remember, there's no standing still. As methods advance, so must you. You'll go either forward—or backward.

New methods shortcut production . . . simplify handling . . . put plusses into metals . . .

IF your plant is in step with '54 standards, you should be doing more heat treating than you did a few years ago.

It's another way to pinch production pennies, to get the most out of a material by adding engineering extras.

Check These — You're in for a surprise if your heat-treat thinking isn't up to date. The technology is coming up fast. New facts are known about the exact conditions needed to get a given property. Automatic controlled atmosphere operations yield bright, scale-free work to exact specifications. Induction and flame methods give a degree of selective hardening that often permits use of carbon steel in place of alloy.

What might be called "heat treating overhead" is getting a real going over. The target is those troublemakers that mean extra work, distortion, decarburization, scaling and back-and-forth handling. Modern methods cut these nonproductive costs right to the bone.

Take Salt Baths — Hot salt has been used for years to heat treat metals; but it is the basis for some of today's most advanced methods.

For instance, molten salt, vigorously agitated, has high cooling power, which is relied upon in austempering, martempering, cyclic annealing and other new treatments involving the interrupted quench. Metal parts are endowed with new physicals. Distortion is held to a minimum. Many parts can be finish-machined while soft, before hardening.

New salt baths for carburizing combine washability and higher temperature operation. Processing time is trimmed and the salt can be washed from work without difficulty after oil quenching. Salt baths may allow you to combine two operations into one, such as carburizing-brazing or carburizing-martempering.

Get Old Fast—If you talk with a plant man who has checked his atmosphere equipment against '54 standards, he'll tell you that furnaces 10 years old are obsolete:

if they are 5 years old, it's time to see if modern techniques will save you money.

Scale elimination and carbon control are major achievements of atmosphere methods in hardening, annealing, stress relief, etc. A unit for automatic carbon control works in the range of 0.20 to 1.25 per cent carbon at temperatures anywhere between 1400 to 2000°F. Accuracy is plus or minus 0.02 per cent carbon.

Here are more things automatic control can do: 1. Shows degree of furnace conditioning. 2. Indicates amount of contamination during loading. 3. Tells purging time required for change in process. 4. Compensates for load and surface area requirements. 5. Gives a permanent record of the operation.

Possibilities—Homogeneous carburizing may suggest changes in your materials or processing methods. It raises carbon content of a low carbon steel to a medium or high carbon level throughout the entire section. A 1010 steel becomes a 0.50 or 0.80 carbon steel.

Economies come from ease of forming low carbon steel, then imparting mechanical properties of high carbon steel. Complicated stampings with sharp bends are formed without cracking. Rejects decline. Stampings are quenched direct from the furnace to give hardness needed.

Carbonitriding adds carbon and nitrogen to steel. Compared with straight carburizing, nitrogen lowers the critical point and increases hardenability. This means you can harden cheap low carbon C1010, C1020 or screw stock, such as C1113, with an oil quench, even in fairly large sections.

In nitriding the two-stage Floe process goes a long way to eliminate final grinding and lapping by reducing the depth of the white layer to the point where it does not chip or spall, but, instead, acts as a good wearing surface. Wearing surface of parts is put into service in as-nitrided condition.

Where It's Needed — Selective hardening uses high frequency induction or precision flame control to localize heat in a special area. The part is then quenched to give a hardened case. Hardness is put exactly where it's needed; this makes it possible for you to use leaner alloys and carbon steel for some parts.

Induction and flame methods can play an important part in your drive on heat treating overhead. Hardening machines go right in the production line. Heating is fast not only just to get the production out but to eliminate scale, minimize distortion and leave core properties unchanged. Induction also is doing a push button job in tempering, normalizing, stress relieving and drawing.

Automatic methods guarantee uniformity . . . cut labor . . . give full value of new processes

HOW much productive manpower are you spending on the corrosion resistance and appearance of your products?

Chances are, surface treatment accounts for one-fourth to one-third of your plant's total activity. At least, that's the picture at the average plant.

And like Mr. Average Manufacturer, you want to get out a better looking product for today's market. New materials and processes are being developed to help you do a better finishing job, and you should take full advantage of them. But remember: The way you engineer them into your production line can have a lot to do with how much quality costs.

Take Plating—Next time you're in a modern plating room watching chrome plated parts come from the final rinse or dryer, ask yourself: How were they doing the job 10 years ago?

Then (as now) parts were bright and shiny. The big difference today is the way a large number of parts is processed through pretreatment and plating cycles.

Repeat Performance—Automatic plating equipment gives savings that may not be apparent at first. Unit cost is reduced by eliminating individual handling. One new bulk plating machine can handle loads of 3500 lb per hour with one man running the show. Parts are loaded and unloaded automatically. Plating conveyors can also be tied in with automatic loading and unloading devices for racked parts.

Plating machines guarantee uniformity of finish. Every part gets the same treatment. The machine cannot skip a rinse or leave a rack in the acid dip too long. And when the plate is not up to par, it's easier to trace the trouble.

Check This—What's the story in your organic finishing department? Perhaps automatic painting is the next step to lower production costs. Smooth, uniform finishes go on at high speed. In one plant, an automatic machine paints carpet sweeper tops at 14,000 sq ft an hr.

Whether you are working with flat objects, parts traveling on overhead conveyors or components that require both inner and outer coatings, the job can be done automatically. Electrostatic painting, hot spray methods and improved baking facilities are helping many

producers trim material consumption and get a better finish at the same time. Catalyzed spray painting may be an important part of your finishing plans. Ten mil coatings can be put on in one pass.

Mechanization of polishing and buffing, bulk tumbling and abrasive belts also are key factors in turning out better finishes economically.

Don't Neglect—If the cleaning requirements for your product are carefully studied, a "best way" of doing the job will come out.

Precleaning before final cleaning is gaining attention because of over-all savings and fewer rejects. If many parts must be cleaned fast enough to keep a production line moving, a washing machine is a good investment. Where different metals are handled on the same line or where metals have high chemical activity, solvent instead of chemical action for removal of soil often simplifies the process. Perhaps a room temperature type cleaner can do your job. If so, there are advantages.

Ask yourself: Are proper temperatures for alkaline cleaners guaranteed by automatic controls? Is the cleaner always at recommended strength?

React with Surface—When solutions do this, a conversion coating is the result. It protects steel, zinc and aluminum against corrosion, paint stripping and unreasonable wear. Maybe you aren't taking full advantage of what you can do with this type coating. Here's an example from the auto industry:

Body and sheet metal parts are given a zinc-iron phosphate coating before painting. Pistons, if cast iron, are coated with manganese-iron phosphate; if aluminum, they are anodized. The zinc die cast fuel pump is chromate treated; so are zinc plated parts, sometimes followed with a clear lacquer. Assorted hardware, such as nuts, bolts, pins and washers, are given a zinc or manganese type phosphate coating impregnated with a small amount of chromic acid and rust preventive oil. The rocker arm, camshaft and other wear surfaces are coated with manganese-iron phosphate.

Pearlitic malleable iron . . . shell molding . . . bigger diecastings bear watching

IF YOU use castings, you never had it so good.

Your own foundry or job foundries can turn out products undreamed of a few years back.

Moving Fast — Investment castings, pearlitic malleable iron and shell molding are comers. Investment castings up to 20 lb are not unusual; around 4 lb is common. Tolerances in dimensions and metallurgy are narrowing. Over 150 alloys are being investment cast. Here may be your answer to getting costs down.

Pearlitic malleable iron adds the valuable feature of differential hardening to its parent, malleable. Typical features are minimum strength 60,000 to 90,000 psi, yield point 43,000 to 70,000 psi, elongation value 2 to 10 per cent. You can expect others with higher tensile strengths to be available soon. It's a real contender with forgings.

If you need close dimensional control and good surface finish on your castings, shell molding is your dish. It's becoming cost competitive with green sand molding in many cases, especially where cores can be eliminated.

High Potential—Watch vacuum and inert gas melting, casting and degassing. They are growing fast for casting problem metals like titanium, zirconium and high-temperature alloys. Vacuum degassing is being used to pull hydrogen out of molten aluminum. Stronger, less porous castings are the outlook.

Centrifugal casting whirls out tubing of almost any analysis. Dual forms, such as stainless on carbon steel, are being cast.

Old Standbys—Improved foundry techniques, including critical moisture control and high-pressure molding are bringing narrower dimensional tolerances to green sand molding. More foundries are building up quality control and nondestructive testing programs. Workhorse gray iron will benefit. Advances in castability, such as more complex shapes, thinner sections, denser castings, are good reason to re-examine your products for places where castings can do the job better.

Diecasters have some tricks up their sleeves. The trend is to larger and more intricate die castings. One machine now turns out 75-lb castings in aluminum, can be adapted to 200 pounders in zinc. Tests show alloy die castings are practicable for highly stressed parts such as automotive clutch housings.

More Angles—Reconsider bronze alloys for specific properties such as high strength and resistance to cavitation, erosion, fatigue and impact. Watch how aircraft demand pushes development in magnesium castings. Higher temperature magnesium alloy castings are here.

And don't overlook combinations of casting and other metalworking techniques. Where a single casting becomes too complicated, there's lots to be gained by casting components and assembling them by welding. It's a real cost cutter.

Cold extrusion still looks big . . . so do rubber-pad forming and automation . . .

COMPETITION is a two-way catalyst in the forming industry. Companies are stimulated to improve and their acceptance of automation is accelerated.

Either way, you can't lose. Run down the list of metalforming operations in your plant with a critical eye. You'll find few that can't be improved.

Still Here — Despite relative quiet on the subject in recent months, cold extrusion still is growing. After the large splash it made several months ago, it seems to have settled down to the slow process of evolution on plant-by-plant basis.

While it's true that the biggest field for cold extrusion is in the automotive industry (one of the big three is talking about a cold extrusion plant), it also is ripe for uses which are far beyond that limited field.

Fear — Perhaps emphasis on critical punch, die, lubrication, etc., problems scared away some potential users. While this makes sense (since experience and know-how are based on the established) it won't stop the advance of cold extrusion.

Reasons for its success are wrapped up in inherent advantages: Savings on raw materials due to improved physicals of finished product, utilization of virtually all raw material in the finished part (consequent scrap reduction), reduction of secondary operations like machining.

The metallurgist is in the middle of the cold work trend in more ways than one. While the goal—more strength and hardness in steel by cold working instead of upping the alloy content—is a sound one, he is faced with two problems: 1. Need for carbon steel bars and billets of exacting standards of surface and internal quality for cold extrusion. 2. Development of die steel that will stand up to terrific pressures.

Tools—Producers of materials are plugging away at the problem of better cold working dies and heat treating procedures to go along with them. One cold extruder working with 1700 tons of pressure uses a specially heat-treated 18-4-1 high speed steel for the punch. Ring die is a manganese - chromium - molybdenum steel, which is nondeforming and air hardening.

Improved hot work die materials are being developed for extrusion dies and coining work. Chromium carbides are giving good results with nonferrous metals. Carbides under development promise better performance in the near future.

Popular—As in almost every other phase of metalworking, automation is being grasped by the forming industry. While most people still think of it in terms of vast sums of money and production rates approaching infinity, you can get in on the ground floor if you try to apply it on your normal level—even though your production requirements and capital are limited.

One manufacturer paid less than $3000 for homemade automation—a feeding device on a punch press. He cut his cost per piece to one-eighth, reduced his man-hour requirements one-fourth.

A good understanding of what you can do with automation is becoming more important now, as you closely consider production potential and per-piece costs.

Comer—Use of a rubber pad as one of the "dies" got off to a fast start in the aircraft industry. Expensive die sets are eliminated; all you need is a male form block. The flexible member conforms to it.

Rubber-pad forming is particularly advantageous when you are forming different parts in small quantities. Also, most users have been able to make big reductions in subsequent hand working.

Backing up the rubber pad with a hydraulic fluid has extended the possibilities of the method. It is being used successfully for deep drawing. Problems with the equipment (inherent in any new process) are solved, and rubber-pad forming is on its own.

Plastic Dies—The chemist has given the forming industry a helping hand, too. Thanks to plastic developments and the technique of strength-building with laminations of glasscloth, die designers are able to lay up dies quickly and inexpensively. Die repairs, in many instances, can be made right on the press.

While many of the early plastic die problems are minimized now, your best bet for the present is to limit plastic activities to development work for steel dies and short runs. Figure on tryouts of not over 20 operating hours. High speed, high production runs are still on the horizon, as are blanking, piercing, trimming and hot forming.

Processes on the preferred list are: Drawing, forming, hydroforming, rubber pad pressing, drop hammer and stretch forming.

Broader Horizons — If you're still classifying cold heading as the prime tool of the bolt and rivet maker, take heed: An appliance manufacturer cut timer stud costs from $52.50 to $10.50 per 1000. Another company cold heads aligning and adjusting mechanisms with savings from $7 to $20 per 1000.

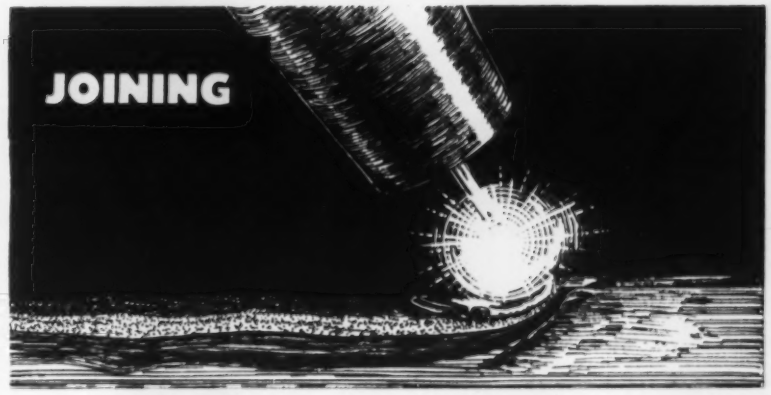
Flow turning of metal is now in a heavier weight class where savings add up faster. One job that used to start with a 369-lb forging now takes a 65-lb blank to make a finished part weighing 50 lb. Savings in material were $228 or 82½ per cent.

Powder Metals—If you looked into the possibility of using metal powder for some of those difficult-to-machine parts and got a "no" answer a while back, take another look. Press builders have recognized the limitations of previous models, and new designs coming on the market will compact bigger, more complex parts with greater accuracy. Powder advances are keeping pace.

At least one press builder has picked up the development ball. He installed a complete production lab in his plant and will take on customer problems. Object, of course, is to gain more powder metal converts and sell more presses.

Heavy Presses—No look at important forming trends would be complete without noting the probable effects of high pressure (up to 50,000 tons) forging. Civilian production won't be involved since all of the presses are government-owned and earmarked for Air Force production.

As in the case of the atom, though, private industry won't be denied the heavy press advantages if it thinks it can use them economically. You can be sure that civilian designers and production men will be eagerly looking over the shoulders of heavy press operators.



Iron powder electrodes spark manual welding . . . automatics still gain . . . check adhesives.

NO joining technique is as versatile or as widely used as welding. What's been happening in the art the last few years is helping to unfurrow the worried brows of many a production man. Advances aren't all in the realm of the new automatics, either.

Just about the time you had reasons to suspect that the "old fashioned" stick electrode method of welding was on the way out, the iron-powder electrode appeared on the scene. The heavy coating of iron powder and flux on this rod helps step up metal deposition some 50 per cent. Slag composition is self-stripping upon cooling.

Electrodes come in different sizes and are used with conventional stick welding equipment. For production jobs that do not warrant semi or fully-automatic welding setups, iron powder electrodes should do a lot to trim that 86 per cent labor cost (per unit of weld).

Inert Gas — Still the biggest newsmakers in the welding field, the inert gas shielded arc processes continue to widen their uses. A mounting number of users report big savings in welding carbon steel. Gas and electrode costs are always higher, but in the unit labor cost column, savings are growing. Weld metal porosity—the biggest deterrent with carbon steel—poses few problems now.

More fabricators are using adapted inert gas tungsten arc guns for spot welding. Beauty is that welds are made from only one side of the work. Sheets up to $\frac{3}{32}$ in. can be welded in flat, vertical or overhead positions. The method promises to supplant self-tapping screws, rivets, soft-soldering and even pressure spot welding in some fabrication jobs.

Submerged Arc—If you're still doing a lot of heavy, multi-pass welding by the stick electrode method, don't fail to check the possibilities of switching to semi or fully-automatic submerged arc welding. But don't think it's for heavy work only.

A railroad car-building shop can tell you. They're taking advantage of the high speed and minimum warpage features of this process to weld 15-gage sheet steel into side panels for cars. Little grinding is needed before painting.

Resistance Welding — You don't have to be an automotive or big appliance builder to get the benefits of high-production resistance welding machines. There is a wide selection of smaller machines for spot, projection or seam welding, and most of them can be adapted to automatic feed and ejection of parts. The initial investment may look prohibitive, but don't turn thumbs down until you know all the plus features.

By the same token, some of those elaborate machines that form and weld cabinets, containers, liners, etc. in one operation often hold hidden advantages—less equipment.

less floor space, reduced handling. Again, don't be frightened away by the price.

Mechanical Fasteners—Two significant goals of the fastener industry—reducing strength/weight ratios and cost of application versus fastener cost—are well in keeping with the competitive times. The former is pretty well an accomplished fact, with some fasteners having tensiles over 100,000 psi.

While fastener application costs are being pared down with the help of new designs and mass-produced specials, they still run anywhere from 5 to 50 times the fastener's unit cost. Keep in mind, however, that unit cost is usually a small fraction of a cent. A "special" fastener is often designed to take the place of several components, sharply reducing the ratio of application/fastener cost.

Saves $10,000 — One company used a double-assembly part — a tapped and grooved steel component produced on a screw machine, plus a slotted round-head machine screw—on a fluorescent fixture. The two were positioned by hand. A single cold-formed part replaces the two, and it is fastened in a conventional hopper-fed rivet-setting machine. Savings are 2 cents on each part; production speed is increased 400 per cent. Savings on this small part are $10,000 a year.

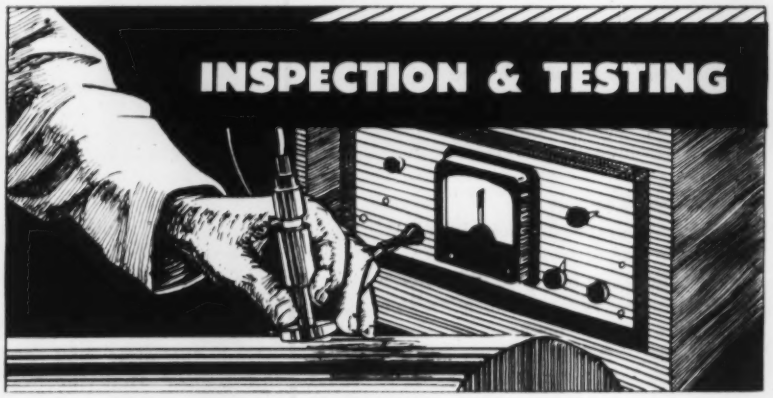
Chances are, you've already spotted several places where a multipurpose part can cut assembly costs. Fastener manufacturers have whole departments working up designs for customers' specials. At least one company will analyze your product from the standpoint of most efficient assembly, free of charge. They're that sure they can interest you in a cost-saving redesign!

Adhesives—Least touted of the joining methods, especially in metalworking, adhesives open up a fresh slant on joining problems. They are being used on such high-strength jobs as bonding brake linings, joining metal sheets for aircraft skins, bonding heavy rubber sheet to steel rolls, mounting heavy machinery on rubber shock pads and others. Some adhesives provide strengths over 3000 psi.

Among the inherent advantages you'll want to consider: Adhesives bond with millions of molecular-sized "fasteners," which distribute the load uniformly, minimizing stress concentrations. With no metal piercing or structure change involved in joining, you can design for thinner sectioned materials. Adhesives also are efficient sound sealers and electrical insulators.

Brazing and Soldering — Here's an area that has really embraced the automation trend. If you haven't paid much attention to some of the advances made in the last few years, chances are you're passing up profits. The range of metals is just about complete. Witness the recent announcement of successful molybdenum brazing.

Continuous atmosphere furnaces and induction heating units are teamed up with automatic parts positioners, braze-metal feeds, etc. to produce a tremendous volume of work. Worried about high temperature limitations and strength of bond? One moly brazing alloy showed short-time shear strength of 18,800 psi at 1800° F.



Defects waste production dollars . . . sooner you detect them . . . the more you save . . .

QUALITY is taking on new meaning in your plant. With labor, materials and equipment costs staying constant (or rising), scientific quality checks at every step in the making of a product are a sure way to lower production costs.

The earlier you test, the better—to take defective parts off the production line while you have a minimum investment in them.

Nondestructive techniques lead the way, measuring properties, sensing capabilities and performance. They work across the board on materials, parts, assemblies, structures and machines without damaging their serviceability. They start where visual inspection leaves off.

Awakening — When nondestructive testing first came on the scene, it was looked on as a routine operation to satisfy inspection requirements. The turning point came when management realized it could be an important factor in production costs.

Today, you see plants using it to insure not only the quality of finished products but also the quality of raw materials and components. Look around! You'll find more and more test installations going into receiving departments.

Versatile inspection methods will handle all types, sizes and shapes of engineering materials. Probing devices based on x-rays, ultrasonics, penetrant fluids, radioisotopes, magnetism or electric current show up the inner secrets of parts of all shapes and sizes.

Cracks, porosity, or blowholes in castings . . . forging bursts and laps . . . cracks from heat treating, shrinkage, fatigue, grinding . . . strings of nonmetallics . . . faulty welds . . . laminations and lack of

bond . . . improper stress distribution. Defects such as these waste production dollars. There's a test method that will handle one part or ten thousand to keep the bad ones off the assembly line.

Inner Secrets—Radiation (x-ray or gamma rays) enters parts as a probing beam. Its intensity changes by passing through (or reflecting from) the material and defects in the test part. Radiation detectors transform differences in intensity of the radiations into readable form. Lightweight x-ray units (weighing 100 instead of 1000 lb) combine portability with power to penetrate 2½ in. of steel.

Penetrant inspection methods show location, shape and extent of discontinuities with remarkable sensitivity in rough castings, welds and finished machined parts. You can get automatic machines for handling and magnetizing the parts, applying the magnetic-particle indicators and displaying the parts for inspection.

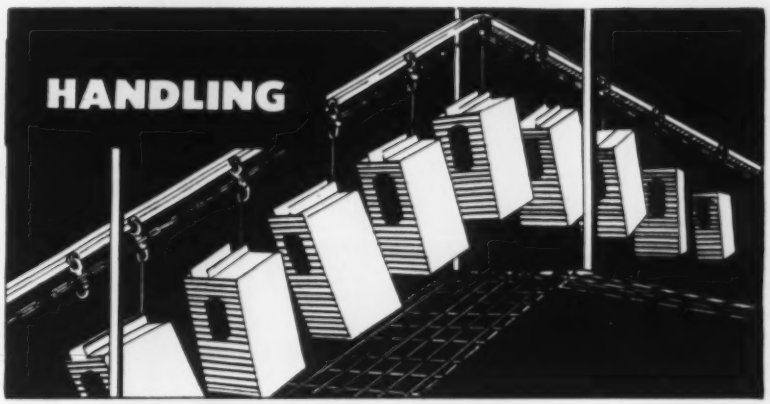
Cheap—Dye penetrants are used to spot check defects in remote locations or where only a few parts are involved. Low first cost of these test kits is an incentive for small plants to do more testing.

Ultrasonics can do a job for you on subsurface defects. The test pattern shows whether a material is O.K. or indicates location of defects. Recording devices (using a punched tape system for repetitive inspection of a large number of parts) are available, as are surface wave techniques for detecting near surface flaws.

In hardness testing, there are machines that fit directly into a conveyor line and make as many as 800 tests an hour. A load test machine (capacity, 50,000 lb) with only two platens is actually eight machines in one.

Recap—In planning your test program bear these points in mind: 1. Quality cannot be inspected into the product; 2. Cost advantages come from proper selection of the tests and locating them at the right sequence in the production line; 3. Interrelation of tests holds the key to complete analysis of component parts.

In the future you'll see emphasis going in the direction of auxiliary equipment that uses test information to control production.



Control unskilled labor cost by conveyor combinations . . . truck specialization

SKILLED LABOR is always an asset; at current rates, unskilled labor almost never is. Keep this in mind when you itemize the bill you're paying for manual handling, and the case for mechanization will be won.

The business of moving materials in process has demanded a continued specialization of equipment. The handling industry has kept up. In many cases, the extent you capitalize on it will be a fair measure of future profit.

The Headliner — You've been reading the most about conveyors because their integration with repetitive processes is the essence of automation. Look for greater exploitation of the trolley types. In the cards are more installations where trolleys move parts through solutions continuously. Another angle: Value of floor space will mean more mass overhead handling incorporating storage of components in process.

Even where your production volume does not warrant built-in handling with complete integration, the conveyor people offer some choice know-how. Important are the relatively simple wheel-type gravity units—no longer cumbersome and stationary. Now a versatile factor in many integrated setups, they've taken on in-process storage banks and live feed-in tables, can be moved and set up in minutes.

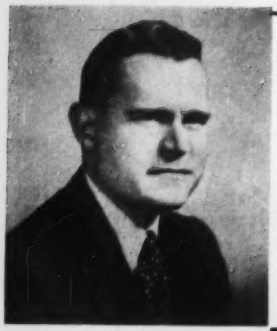
Combinations — The so-called power and free conveying system is a combination to watch. Where flexibility is essental, it fills the bill. It's a monorail system with a trolley conveyor propelling parts from one work area to another, then shunting the trolley to a spur where work is performed.

Trolley and part can be lowered into an infinite number of machines. After work is completed, the operator simply powers the part to the next station. The system lends itself to automatic dispatching to many stations.

The Workhorse — Most plants still depend on trucks for at least part of their handling. While mention of handling no longer implies lift trucks with the certainty it once did, improved equipment keeps the trucks in a significant position. Better batteries and emphasis on maintenance know-how will mean more electrics on repetitive jobs. Gas models benefit from torque converters and gas-electric drives that minimize clutch wear problems.

Specialization has been vital. You'll find a truck attachment to perform almost every pickup, moving and positioning job. The principle extends from barrel and scrap dumping to 15,000-lb coil positioners.

Getting parts to machines when they're needed means sharp scheduling. To achieve this requires effective communication among departments. Certainly the most promising technique is in electronics. If you're operating trucks between departments, radio can pay for itself overnight. You can expect some relaxation of tight FCC controls on the medium.



George A. Roberts
ASM New President-elect

A. O. Schafer
ASM Vice-President-elect

36TH NATIONAL METAL CONGRESS and EXPOSITION

PROGRAM

AMERICAN SOCIETY FOR METALS

Seminar on Impurities and Imperfections

(All Sessions in Ballroom, Palmer House)

Saturday, Oct. 30—9:30 a.m.

Lattice Vacancies and Interstitials—Harvey Brooks, Harvard University. Dislocations—J. C. Fisher, General Electric Co.

Grain Boundaries, Substructure and Impurities—R. W. Cahn, University of Birmingham, England (Visiting Lecturer, Johns Hopkins University).

Saturday, Oct. 30—2 p.m.

Effects on Crystal Growth—Bruce Chalmers, Harvard University.

Effects and Imperfections in Metallic Diffusion—David Lazarus, University of Illinois.

Role of Structural Impurities on Phase Transformations—David Turnbull, General Electric Co.

Sunday, Oct. 31—9:30 a.m.

Effects on Mechanical Properties—E. R. Parker, University of California.

Effects on Electrical Properties—J. S. Koehler, University of Illinois.

Effects on Chemical Properties—W. D. Robertson, Yale University.

Sunday, Oct. 31—2 p.m.

Impurity Phenomena in Semiconductors—J. A. Burton, Bell Telephone Laboratory.

Effects on Dielectrics and Ionic Crystals—R. J. Maurer, University of Illinois.

Radiation Damage—Frederick Seitz, University of Illinois.

ASM TECHNICAL PAPERS

Monday, Nov. 1—9:30 a.m.

Constitutional Diagrams

Aluminum-Vanadium Alloy System—O. N. Carlson, D. J. Kenny and H. A. Wilhelm, Institute for Atomic Research and Department of Chemistry, Iowa State College.

Partial Phase Diagram of the Iron-Cerium System—James O. Jepson, research engineer, Jet Propulsion Laboratory and Pol Duwez, professor of mechanical engineering and chief of materials section of Jet Propulsion Laboratory, California Institute of Technology.

Titanium-Cobalt System—F. L. Orrell Jr., Dow Chemical Co., Midland, Mich., and M. G. Fontana, head, Department of Metallurgy, Ohio State University.

System Titanium-Aluminum-Manganese—R. F. Domagala, associate metallurgist and W. Rostoker, senior metallurgist, Research Department, Armour Research Foundation of Illinois Institute of Technology.

Constitution of Ordering Alloys of the System Copper-Gold—F. N. Rhines, professor of metallurgy, W. E. Bond, research assistant, and R. A. Rummel, laboratory assistant, Metals Research Laboratory, Carnegie Institute of Technology.

Monday, Nov. 1—2 p.m.

Mechanical Metallurgy

Effect of Prestraining Under Different Stress States on the Fracture and Flow Properties of 2S-O Aluminum—I. Rozalsky, Wood River Research Laboratory, Shell Oil Co.

a CMP cost cutting report

ON THIS SPRING STEEL PART

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Booth No. 141
International Amphitheater
Chicago—Nov. 1-5

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ASM PROGRAM

Deformation Mechanisms in Polycrystalline Aggregates of Magnesium—F. E. Hauser, C. D. Starr, L. S. Tietz and J. E. Dorn, professors of metallurgy, Minerals Research Laboratory, University of California.

Tensile and Impact Properties of Low Carbon Martensites—C. C. Busby and H. W. Paxton, Metals Research Laboratory, Carnegie Institute of Technology; M. F. Hawkes, Quality Engineering Laboratory, U. S. Naval Ammunition Depot, Hawaii.

Tensile Characteristics of Unalloyed Zirconium at Low and Moderate Temperatures—J. H. Keeler, Research Laboratory, General Electric Co.

Monday, Nov. 1—2 p.m.

Processing

The Influence of Chemical Composition of the Machinability of Rephosphorized Open Hearth Screw Steel—E. J. Paliwoda, research engineer, Metal Research Division, Jones & Laughlin Steel Corp.

The Influence of the Grinding Process on the Structure of Hardened Steel—W. E. Littmann, research metallurgist, Timken Roller Bearing Co., Canton, O., and John Wulff, professor of metallurgy, Massachusetts Institute of Technology.

The Zonal Rolling Texture of Low Carbon Steel Cold-Rolled at Various Temperatures—C. Nusbaum, associate professor of physics, Case Institute of Technology and consultant, Cold Metal Products Co. and W. Brenner Jr., metallurgist, Cold Metal Products Co.

Tuesday, Nov. 2—9:30 a.m.

Hardenability

An Electron Metallographic Study of the Dependence of Microstructure on Hardenability—S. T. Ross, project engineer, R. P. Sernka, research metallurgist and W. E. Jominy, chief-metallurgical research, Chrysler Corp.

Calculation of Hardenability in High Carbon Alloy Steels—C. F. Jatczak and R. W. Devine Jr., research metallurgists, Timken Roller Bearing Co.

The Hardenability of Carbon Tool Steel—N. J. Culp, Metallurgical Department, Carpenter Steel Co.

Effect of Carbon and Nitrogen on the Attainable Hardness of Martensitic Steels—A. E. Nehrenberg, P. Payson and P. Lillys, Research Laboratory, Crucible Steel Co. of America.

Tuesday, Nov. 2—2 p.m.

Physical Metallurgy

Conditions for Dendritic Growth in Alloys—W. Morris, W. A. Tiller, J. W. Rutter and W. C. Winegard, Department of Metallurgical Engineering, University of Toronto, Toronto, Canada.

Stress-Corrosion Mechanism in a Magnesium-Base Alloy—D. K. Priest, Pfaudler Co., F. H. Beck, assistant research professor, and M. G. Fontana, professor, Department of Metallurgy, Ohio State University.

Thermodynamics of Binary Interstitial Solid Solutions—R. Speiser, associate professor, Department of Metallurgy, Ohio State University.

Influence of Substructure on the Shape of the Creep Curve—T. Hazlett and R. D. Hansen, Research Engineering Department, University of California.

Wednesday, Nov. 3—2 p.m.

Ferrous Physical Metallurgy

Further Study of Microstructural Changes on Tempering Iron-Carbon Alloys—B. S. Lement, research staff (Division, Industrial Co-operation), B. I. Averbach, associate professor and M. Cohen, professor of physical metallurgy, Massachusetts Institute of Technology.

Effect of Cold-Work on Cementite in Steel—D. V. Wilson lecturer, Department of Industrial Metallurgy, Birmingham University, Edgbaston, Birmingham, England.

The Isothermal Transformation of Austenite Under Externally Applied Tensile Stress—S. Bhattacharyya and G. L. Kehl, associate professor of metallurgy, Columbia University.

Wednesday, Nov. 3—9 a.m.

ASM Annual Meeting
Campbell Memorial Lecture
Kent R. Van Horn
Aluminum Company of America

Wednesday, Nov. 3—2 p.m.

Mechanical Properties

The Elastic Limit and Yield Behavior of Hardened Steels—H. Muir, senior lecturer, Otago University, Dunedin, New Zealand; B. L. Averbach, associate professor and Morris Cohen, professor, Department of Metallurgy, Massachusetts Institute of Technology.

Effect of Composition on Transverse Properties of Slack-Quenched Steel—J. Vajda and P. E. Busby, Metals Research Laboratory, Carnegie Institute of Technology.

The Statistical Fatigue Properties of Lamellar and Spheroidal Eutectoid Steel—G. E. Dieter, Ordnance Corps; R. F. Mehl, director, Metals Research Laboratory and G. T. Horne, Metals Research Laboratory, Carnegie Institute of Technology.

Effect of Static Stress on the Damping of Some Engineering Alloys—A. W. Cochardt, Metallurgy Department, Westinghouse Electric Corp.

Thursday, Nov. 4—9:30 a.m.

Stainless

The Effect of Cold Work and Recrystallization on the Formation of the Sigma Phase in Highly Stable Austenitic Stainless Steels—A. J. Lena, associate director of research and W. E. Curry, chief metallographer, Allegheny Ludlum Steel Corp.

The Laves and Chi Phases in a Modified 12 Cr Stainless Alloy—F. L. VerSnyder and H. J. Beattie Jr., Thomson Laboratory, General Electric Co.

Austenitic Chromium-Manganese-Nickel Steels Containing Nitrogen—R. Franks, manager, W. O. Binder, and J. Thompson, Technical Service and Development Dept., Electro Metallurgical Co.

The Effect of Deformation on the Martensitic Transformation in Austenitic Stainless Steels—H. C. Fiedler, Research Laboratory, General Electric Co.; B. L. Averbach, associate professor, and M. Cohen, professor, Department of Metallurgy, Massachusetts Institute of Technology.

Thursday, Nov. 4—9:30 a.m.

Heat Treatment

The Role of Water Vapor and Ammonia in Case Hardening Atmospheres—P. A. Clarkin and M. B. Bever, Department of Metallurgy, Massachusetts Institute of Technology.

Effect of Heat Treatment Upon Microstructures, Microconstituents, and Hardness of a Wrought Cobalt Base Alloy—J. W. Weeton and R. A. Signorelli, Lewis Flight Propulsion Laboratory, NACA, Cleveland.

Secondary Graphitization of Quenched and Tempered Ductile Cast Iron—J. C. Danko and J. F. Libsch, Department of Metallurgy, Lehigh University.

A Method for Determining the Continuous Cooling Transformations in Steel—R. D. Chapman, research metallurgist and W. E. Jominy, chief metallurgist-research, Engineering Division, Chrysler Corp.

Thursday, Nov. 4—2 p.m.

High Temperature

Elevated Temperature Properties of Ductile Cast Irons—C. R. Wilks, metallurgist; N. A. Matthews, assistant chief metallurgist and R. Wayne Kraft Jr., metallurgist, American Brake Shoe Co.

Effect of Cold Work on the High Temperature Creep Properties of Dilute Aluminum Alloys—R. E. Frenkel, research engineer, Oleg D. Sherby, research engineer; and John E. Dorn, professor of physical metallurgy, University of California.

Creep-Tempering Relationships in Hardened 4.5 Per Cent Chromium Steels—E. C. Roberts, assistant professor of Metallurgy, Montana School of Mines; N. J. Grant, associate professor of metallurgy and Morris Cohen, professor of metallurgy, Massachusetts Institute of Technology.

The Strength of Wrought Zirconium-Base Binary Alloys at 1800 to 2200° F—H. A. Saller, J. T. Stacy and S. W. Porembka, Battelle Memorial Institute.

You'll have to come see it yourself!

See these new Torrington wire forming machines at the National Metals Show

W-3001 Torsion Spring Winder New design features provide extra large tooling area, sturdier tooling, faster set-up. Great capacity for additional tooling gives broad versatility in the production of complex forms.

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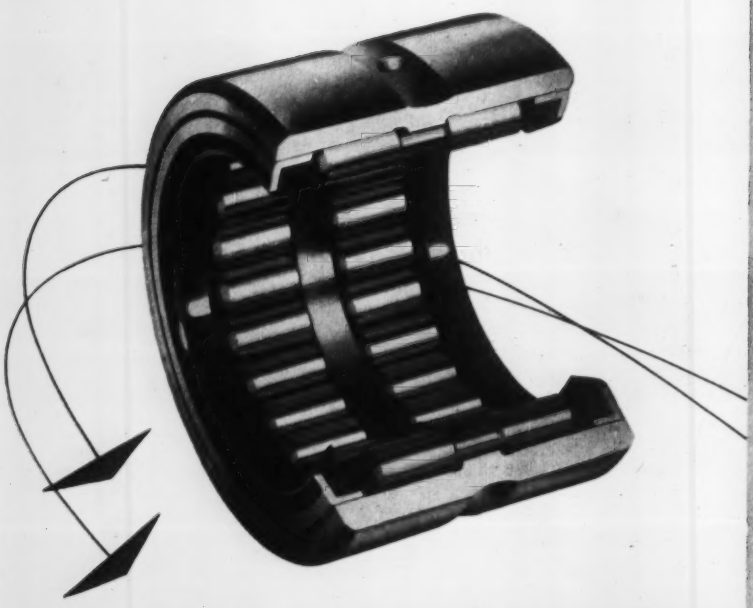

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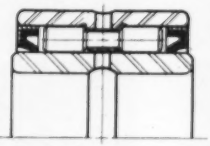
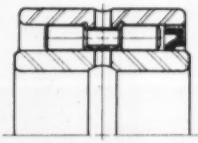
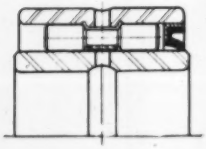


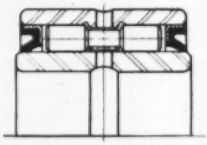
SS—Double seal, lips in. For lifetime retention of lubricant.



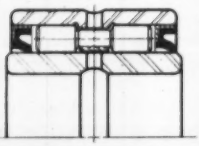
S—Single seal, lip in. Retain lubricant. Usually another sealed bearing at other end of shaft.



RS—Single seal, lip out. Used opposite another bearing to prevent entry of foreign material from one face.



RSS—Double seal, lips out. Prevents entry of foreign materials from both faces.



SRS—Double seal, one lip in, one lip out. For easy relubricating without displacing seal.

McGILL®
precision bearings

Laboratory Instruction In Process Metallurgy

Monday, Nov. 1—9:30 a.m.

Palmer House

Development of Laboratory Experiments for the Unit Process Approach to Extractive Metallurgy—R. Schuhmann Jr., Purdue University.

Role of Metallurgical and Thermodynamic Problems in the Metallurgical Engineering Laboratory—C. S. Samis, University of British Columbia.

Unit Process Experiments in Fluid Flow, Combustion and Heat Transfer for Metallurgical Engineering Students—W. O. Philbrook, Carnegie Institute of Technology.

Special Problems for Experiments in Process Metallurgy Laboratory—A. W. Schlechten, Missouri School of Mines.

Role of Electrochemical Experiments in Process Metallurgy Instruction—Herbert H. Kellogg, Columbia University.

The society's ninth metallographic exhibit will be held at the International Amphitheatre in conjunction with the metal show. Eleven classes of micros are designated for the contest.

A committee of judges will award a first prize to the best entry in each classification. A grand prize will be presented to the exhibitor whose entry is judged best in the show. Previous exhibit material is not acceptable.

Lecture Course on Temperature Measurement

(All Sessions in Room 14, Palmer House)

Monday, Nov. 1—4:30 p.m.

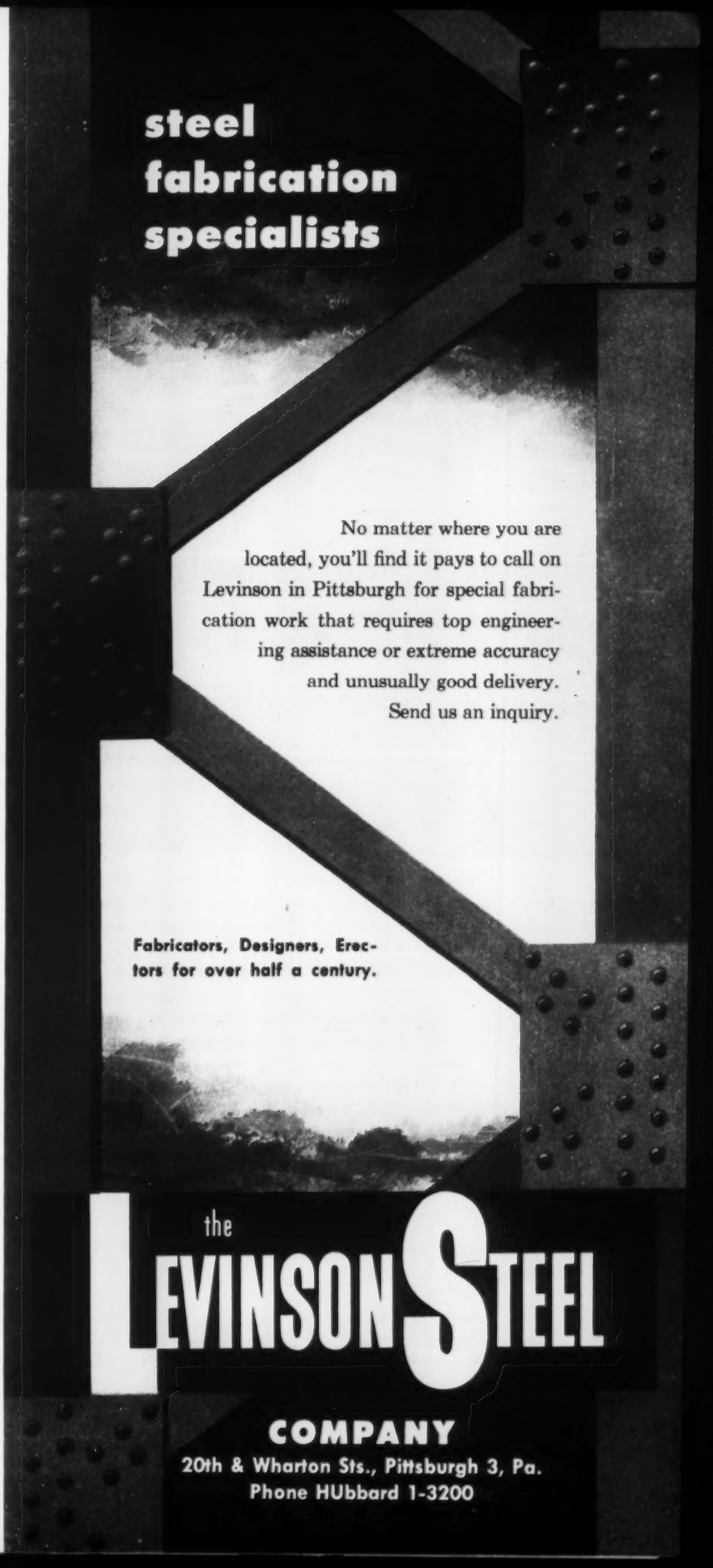
Industrial Temperature Measurement With Thermocouple Pyrometers—W. E. Belcher Jr., Minneapolis-Honeywell Regulator Co., Brown Instruments Division.

Tuesday, Nov. 2—4:30 p.m.

Industrial Temperature Measurement With Total Radiation and Optical Pyrometers—Donald Robertson, Leeds & Northrup Co.

Wednesday, Nov. 3—4:30 p.m.

Industrial Temperature Measurement With Resistance Thermometers and Filled Systems—W. F. Hickes, Foxboro Co.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fabrication
specialists
No matter where you are located, you'll find it pays to call on Levinson in Pittsburgh for special fabrication work that requires top engineering assistance or extreme accuracy and unusually good delivery. Send us an inquiry.
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LEVINSON STEEL
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Stainless Steel Flange 2⅛" thick x 28⅛" OD x 9¾" ID

forged in stainless steel and rough machined by G. O. CARLSON, INC.

By working exclusively in stainless steels, the Carlson organization has an expert's knowledge and experience in the field. This is important whether you need plate (large or small, straight or cut-to-pattern), diameters, heads, rings, forgings or other stainless products.

The illustration shows (in a front and back view) a typical forging made of stainless steel. This flange was forged of Type 316 stainless and rough machined in our plant. The customer, by using this Carlson service, was able to finish-machine the part in record time . . . and shipping charges and material waste were held to a minimum.

As just one segment of our over-all service in stainless steels, G. O. Carlson, Inc. produces forgings in all sizes and analyses to chemical industry standards—rough machined, ready for finishing.

If you need stainless steel, our engineering staff will be glad to help . . . just send along your inquiry.

Stainless Steel is our only business . . . and we know it

Stainless Steels Exclusively

G. O. CARLSON, INC.

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

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IHES

L. H. Gillette
President

Industrial Heating Equipment Association

PROGRAM

Three Special Sessions

Tuesday Morning, Nov. 2, 1954

Palmer House

Atmospheres

Theory of Gases—Allen G. Hotchkiss, General Electric Co.
Exothermic Atmosphere—W. H. Boyd, Gas Atmospheres Inc.
Endothermic Atmosphere—Ralph J. Perrine, Electric Furnace Co.
Dry Nitrogen-Base-Prepared-Atmosphere—Donald Beggs, Surface Combustion Co.
Dissociated Ammonia—M. R. Ogle, Drever Co.
Control and Safety—W. L. Besselman, Leeds & Northrup Co.

Tuesday Afternoon, Nov. 2, 1954

International Amphitheatre

Atmosphere Applications

Carburizing—Walter Holcroft, Holcroft & Co.
Equilibrium Relationship for Dew Point Measurement and Control—N. K. Koebel, Lindberg Engineering Co.
Practical Applications of Dew Point Measuring and Control—O. E. Cullen, Surface Combustion Co.
Brazing—Movie by Westinghouse Electric Co.
Carbonitriding—Harold Ipsen, Ipsen Industries Inc.
Neutral Heat Treating—A. W. Frank, Hevi-Duty Electric Co.
Sintering—Carl G. Paulson, C. I. Hayes Inc.

Wednesday Afternoon, Nov. 3, 1954

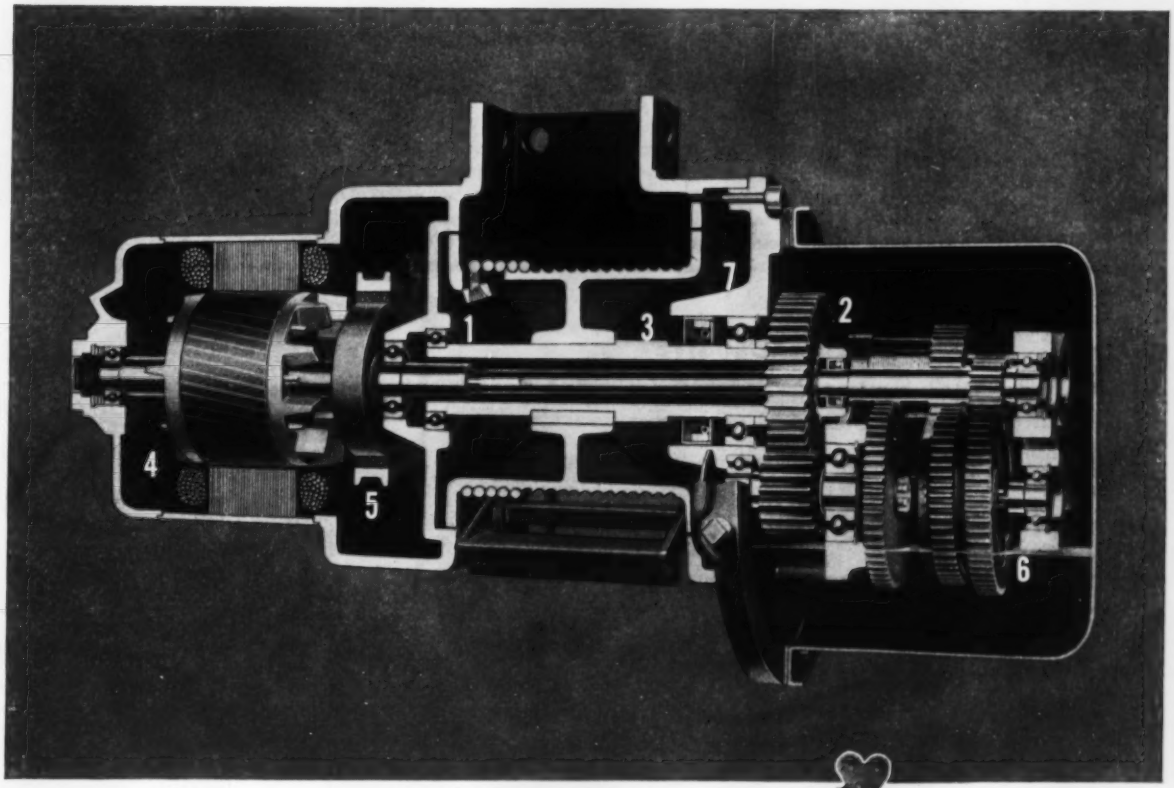
International Amphitheatre

Induction Sessions

Induction Melting—G. W. Holz, Lindberg Engineering Co.
Induction Brazing—E. S. Goodridge, Induction Heating Corp.
Induction Heat Treating—H. B. Osborn Jr., Tocco Division, Ohio Crankshaft Co.
Sixty Cycle Induction Heating for Forming and Extrusion—John A. Logan, Magnethermic Corp.
High Frequency Induction Heating for Hot Forging—Frank T. Chesnut, Ajax Electrothermic Corp.
Dual Frequency Heating for Hot Forging—Carl P. Bernhardt, Westinghouse Electric Corp.

(Continued on p. 163)

TAKE IT UP WITH R&M HOISTS-CRANES-WINCHES



WHY ROBBINS & MYERS "J" HOISTS LAST LONGER

First—because they are built to "big hoist" standards of precision and strength to insure more years of trouble-free life. Here are seven points to prove it: Nine oversize ball **BEARINGS (1)**; hook block also has a sealed bearing sheave. Wide faced **GEARS (2)** heat treated for maximum hardness, longest wear. **SHAFTS (3)** precision ground of high carbon or alloy steel. Special Robbins & Myers high torque hoist duty **MOTOR (4)**. Die cast aluminum rotor; two dips and two bakes on windings. Rating: 30 minutes, 55° C temp. rise. **MOTOR BRAKE (5)** on motor shaft, oversize shoes for long life, quick stops, no drift. Oversize **LOAD BRAKE (6)**, Weston-type, runs in oil. Single unit aluminum **FRAME (7)** ribbed for extra strength, jig bored for accurate alignment. Type "J" hoist capacities from 500 to 4000 lbs. Prices start at $268.00.

☐ Send Bulletin 851-B ☐ Have representative call

VENTILATORS MOYNO PUMPS HOISTS CRANES MOTORS FANS

ROBBINS & MYERS INC.

SPRINGFIELD, OHIO BRANTFORD, ONTARIO

A STEEL EXCLUSIVE

Since the late 30's, when lead was first successfully added to steel for better machining, the process and techniques have been closely guarded secrets—shared only by Inland Steel Co. and its licensees. Here, for the first time, details of the process are revealed. For reprints of this article, write to STEEL, 1213 W. 3rd St., Cleveland 13.

Adding Lead to Steel . .

To enhance machinability, tiny lead pellets are gunned into molten steel as the ingots are being poured. Problems of lead quantity and segregation are solved by close control

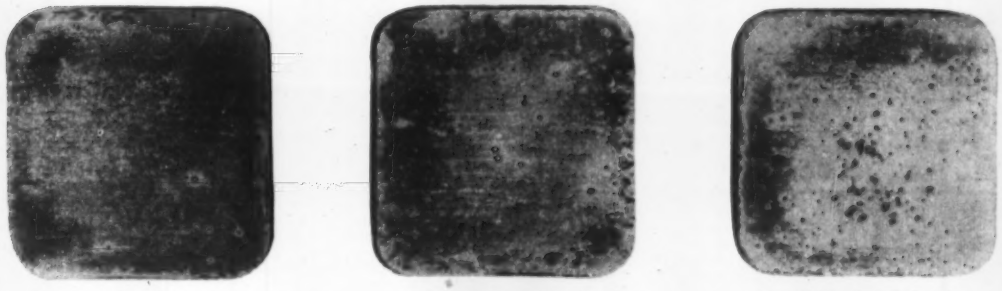
PUTTING LEAD in steel is about like everything else—easy if you know how. Inland Steel Co., with the aid of Battelle Institute, got on the right track in 1939, and they've been enhancing the machinability of steels with lead additions ever since.

Actually, the problem of getting lead into the steel is only half the battle. If that were the only hurdle, leaded steels would have been with us long ago.

Discipline—Behavior of the lead once it's a part of the steel is what makes the whole problem tough. Lead must be well dispersed. It must not be allowed to accumulate in small globules that will form stringers when the steel is rolled into bars.

Stringers, the old bugaboo to

Specimens shown here have been exudation (sweat) tested. Presence of lead is indicated by a lead bead appearing at the surface. For this test, each test piece is heated to 1290° F. Failure to meet minimum standards requires rejecting and retesting portions of the bottom cut or succeeding cuts of the ingot until minimum standards for acceptance have been met



Good | Minimum for Acceptance | Condition for Rejection

. . . Here's How It's Done

By ROBERT F. HUBER
Machine Tool Editor

leaded steels, can be a nightmare to the steel user. Even in everyday machining, stringers on the surface may part from the steel and leave marks on the machined surface.

Quantity — Like dispersion, the quantity of lead added is critical. There's a practical range in which the lead addition is a strong aid to machinability.

One Solution — Dispersion (including stringer elimination) and quantity questions were answered by the Inland method of adding lead to the ingot at the teeming stage.

Close control of the addition at this point is the secret to making lead work on the side of the cutting tool.

Same Start—General features of furnace practice for leaded steels are identical with those for the corresponding nonleaded steel. No changes from the regular finishing, deoxidation or tapping sequence are required in either open hearth or electric furnaces.

The major departure takes place in pouring leaded heats. Procedures and equipment used in teeming ingots have been developed to assure proper lead distribution.

INLAND PATENTS FOR LEADED STEELS

Number 2,182,759 (Dec. 5, 1939)—covers the addition of lead in the range of 0.03 to 1.00 per cent to alloy steels.

Number 2,197,259 (April 16, 1940)—covers the apparatus for introduction of lead into steel and means for simultaneously removing the gases and fumes generated.

Number 2,215,734 (Sept. 24, 1940)—covers the addition of lead in the range of 0.03 to 1.00 per cent to carbon steels.

Number 2,236,479 (March 25, 1941)—covers the addition of lead in the range of 0.03 to 1.00 per cent to stainless steels.

Number 2,259,342 (Oct. 14, 1941)—covers additional element (lead compound) which is introduced with the lead and which will separate from the lead upon addition to free the lead from the particles to facilitate dispersion.

Close control keeps lead content within proper limits.

Choice — Several satisfactory techniques are being used to make the lead addition. Each uses uniformly-sized, fine shot as the source of lead. In one method, a high-velocity air stream, carrying a regulated supply of lead shot, is blown through a specially-designed gun. It's aimed directly at the stream of metal being teemed from the ladle into the mold.

Another method gravity feeds lead shot through chutes or tubes and directs the flow to meet the stream of hot metal.

Pellets — Lead shot must be reasonably pure and carefully sized. It may be produced in available equipment or purchased from regular commercial sources. To insure predictable performance, the shot must be clean and dry.

To break up lumps, shot is screened before use. Inland has found that the uniformity of shot size is critical to even dispersion.

Gun—The device used at Inland for adding lead to molten steel is known as the lead air blast gun. It has three major parts—air valve, lead funnel or reservoir and barrel or tube.

The air valve controls air flow in the gun. The lead reservoir feeds shot into the air stream in the gun. The barrel directs the lead shot into the stream of molten steel.

When the air is turned on and the lead flows from the reservoir, the high-velocity air stream shoots pellets into the falling liquid metal stream. Pressure of the air stream is low and does not deflect the pouring stream of steel.

The Start — Before a heat is tapped, the number of ingots to be leaded is estimated. Sufficient lead for the heat is weighed and screened. The amount for each ingot is poured into a pail.

When the heat is about to be tapped, pails are taken to the pouring stand along with several spouted pails. Before pouring an ingot, the lead to be added is transferred from the standard pail to the spouted pail, which is used to pour lead shot into the air gun at a regulated rate.

Lead Fumes—Before an ingot is poured, the exhaust hood for fume removal must be in place over the mold.

The effect of lead fumes on the mill crew has been the subject of much speculation and some concern. But with the system of pouring and exhaust used for leaded steels, there has been no case of lead poisoning in plants using the process. This includes Inland and its 30 some licensees and sub-licensees.

Production — As the ladle is moved over an ingot mold, the exhaust system for that mold is activated. The stopper rod is then raised, allowing the steel to run from the nozzle.

After a predetermined interval, the lead air gun is activated. The rate at which the lead is added is determined by the ingot weight and the rate of teeming.

How Much — While any reasonable amount of lead may be added to an ingot, it is common practice at Inland to aim for 0.15 to 0.35 per cent lead in the finished product. For any given set of operating conditions, the percentage of lead getting through to the finished product varies within a usable or practical band. In general, it depends primarily on the amount added to the stream.

Under normal conditions, recoveries increase sharply as the lead addition approaches a value between 0.20 and 0.25 per cent. This range is considered by Inland to be the target for normal operations. Beyond this, the percentage recovery decreases.

Standard — Practices followed in stripping, delivery, blooming-mill heating and in the blooming mill are identical to those for the corresponding nonleaded grade. Only exception is the special shearing for testing and identification procedures.

The ingot to bloom yield depends on the ingot structure, the type of mold used and the physical segregation of the added lead.

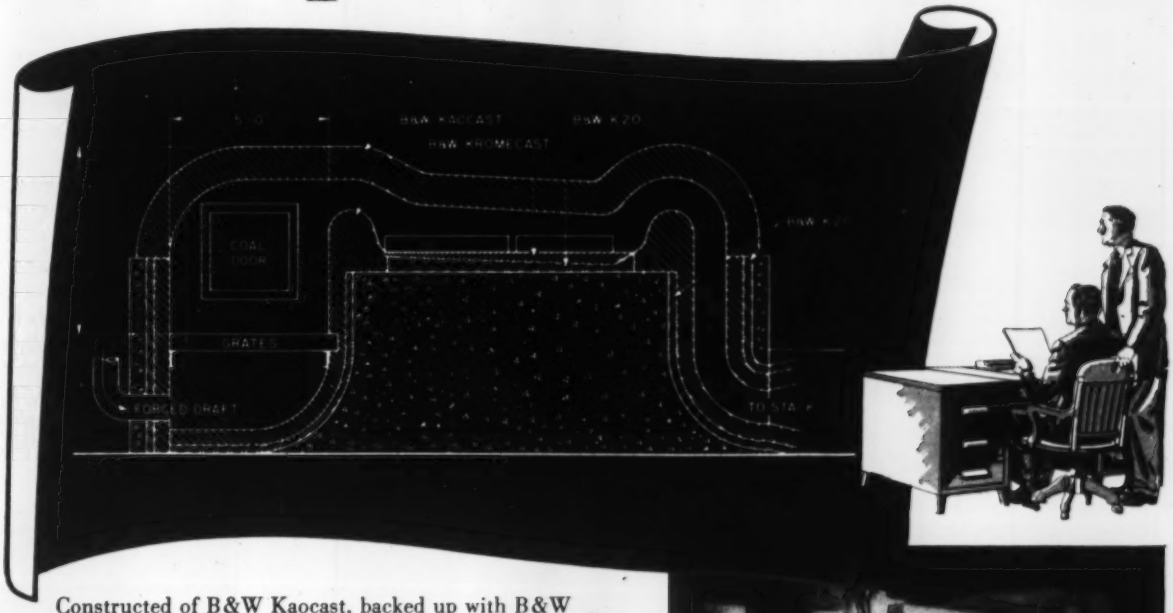
Crop—In general, top crop taken on open top steels should be adequate to assure a sound product and to avoid excessive segregation. For hot top ingots, the top crop should be sufficient to remove all traces of the hot top and collar.

On either hot top or open top ingots, the amount of bottom crop must be sufficient to avoid accumulations of lead near the butt of the ingot. Other than the slightly higher butt crop, the general cropping practice is essentially the same as for the corresponding nonleaded steels.

Testing — Test pieces are obtained at the blooming-mill shears. Each test is stamped with the heat

Catawissa Valve & Fittings Company

BUILDS COMPLETE FURNACE *with B&W Refractory Concretes*



Constructed of B&W Kaocast, backed up with B&W K-20 Insulating Concrete-Mix, and with a hearth of B&W Kromecast, this forge furnace had to stand up under these tough "stop-and-go" conditions:

- **Operated only 8 hours a day**
- **Shut down over week-ends**
- **Coal-fired forced draft with a pressure of 14 ounces**
- **2650 F and higher temperatures**

Heating 125 lbs of steel per square foot of hearth area per hour to a temperature of 2300 F, Catawissa found the furnace took this punishing service so well that they built another one to the same specifications.

Quality control was also improved due to the elimination of inclusions in the forged steel products.

There are good reasons for the excellent performance of these B&W Refractory Concretes. Kaocast, a 3000 degree refractory castable, has high resistance to spalling and slag attack. It offers low volume change and negligible reheat shrinkage. Versatile Kaocast can be molded quickly, easily cast directly in place or applied with a cement gun.

B&W Kromecast provides the necessary resistance to abrasion, to the effects of molten metal, and to slag attack which are so necessary for a forge furnace hearth. The insulating properties of B&W K-20 Insulating Concrete-Mix protect the exterior ordinary concrete lining and hold temperatures down to such an extent that the outside of the furnace can be touched with a bare hand.

These are some of the reasons why B&W Refractory Concretes are being used in so many thousands of applications. Whether you need a whole furnace lining or small special shapes, it pays to investigate B&W Refractory Concretes.

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B&W INSULATING FIREBRICK • B&W REFRACTORY CASTABLES, PLASTICS AND MORTARS

R-49

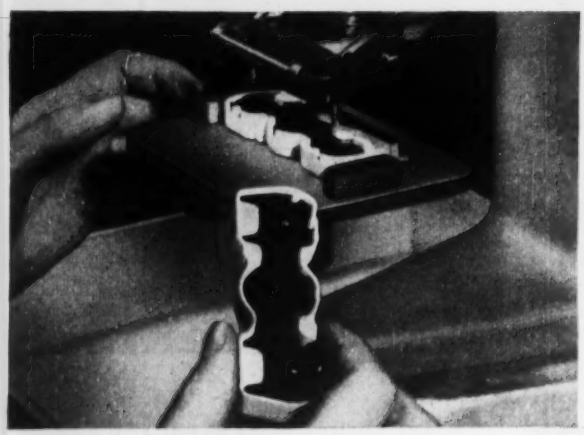
Why stop AUTOMATION at Assembly?

. . . give millions of assembly hands a head start

Progress toward automation* does not end where assembly begins for manufacturers who take full advantage of the P-K Fastening Method. They *eliminate* manual operations like tapping, nut-running, inserts in plastic — and avoid the attendant trouble and expense. Automatic screw driving equipment can be used to further mechanize hand operations on many applications. Assembly savings run up to 50% and more.

Complete automation is, for most, a *distant* dream. Meanwhile, assembly *hands* control your fastening costs. Find out how P-K Self-tapping Screws can *double* — *even triple* — their efficiency. It *pays* — and pays well — *today*. Talk to a P-K Assembly Engineer. Parker-Kalon Division, General American Transportation Corporation, 200 Varick St., New York 14.

Successive elimination of manual operations



AUTOMATIC DRIVING adds *extra* speed to the faster P-K Fastening Method. Here, an automatic, double-spindle, hopper-fed machine is being used for driving two P-K Type U Drive Screws simultaneously in a plastic electric outlet. Single or multiple spindle machines are available from several manufacturers.

MAYTAG ASSEMBLY MOVES FASTER because fastenings made with P-K Self-tapping Screws are simpler, easier, dependably secure. In the Maytag Dryer shown, 80 Type A and 46 Hex Head Type Z are used, in all, for fastening sheets from 24 to 11 gage — driven with air-operated tools.

PARKER-KALON®

The Original SELF-TAPPING SCREWS

IN STOCK . . . see your nearby P-K Distributor

number, ingot number and position letter. Testing is more extensive than for equivalent grades of nonleaded steels because lead additions are made to individual ingots; and because lead (with its limited solubility in steel) tends to liquate and become concentrated near the bottom of the ingot.

Standard testing practice involves the testing of the bottom product from ingots of the leaded steel. Each test piece is analyzed for lead content and exudation (sweat) tested to determine lead distribution. Testing position must be definitely fixed, allowing for no variation or substitution of the test pieces.

Bottom Cut—Test piece is cut from the bottom of the prime product of each tested ingot, immediately above the butt crop. It is used to determine whether sufficient butt crop has been taken to eliminate abnormal concentrations of lead, and to establish the lead composition.

Uniformity of lead distribution is determined by the exudation test or the lead print method. Lead content of each test piece is also determined.

Sweat Test—The exudation test consists of exposing a sawed cross-section of the sample to a temperature of 1290° F for a specified time. Lead distribution is determined by the exudation of lead in the form of beads.

Failure to meet minimum exudation standards requires rejecting and retesting portions of the bottom cut or succeeding cuts of the ingot until minimum standards have been met.

Carryover—Remelting lead bearing steel scrap causes no contamination of equipment or the steel produced. In a typical test, 23 per cent of a total open-hearth charge of 201,000 lb was lead-containing bloom butts.

A bath test at the start of the lime boil showed only 0.0039 per cent lead. The ladle test of the completed heat contained only 0.0013 per cent lead.

Finishing—Until recently, almost 90 per cent of all leaded steels being machined domestically were in the cold drawn condition. Inland, which supplies its Ledloy in hot rolled bars or billets, does no cold drawing, but furnishes the HR bars to be cold drawn or forged. Both Inland and Copperweld report considerable activity in use of Ledloy for forgings.

In cold drawing of leaded bars, George R. Caskey, chief metallurgist, Bliss & Laughlin Inc., Harvey, Ill., says it is common practice to use a $\frac{1}{16}$-in. draft. Draft may be varied to control surface hardness. Cold drawing technique is generally the same as for the corresponding nonleaded grade. There is a suggestion of improved die life with the leaded steels.

About 13 domestic producers have licenses from Inland to make leaded steels—but not all are making the product. Some 20 foreign steelmakers also are licensed, or sub-licensed, on a royalty basis.

Growth—While, by most standards, the steels are being produced in small tonnages, Inland executives are certain of an expanding market. H. W. Browall, supervisor of their quality control department, bar and semifinished products, feels that the large tonnage increases will come in the plain carbon grades, simply because that's where the demand is. Meanwhile, most significant savings on any one job, he points out, may be in the tougher-to-cut alloy grades.

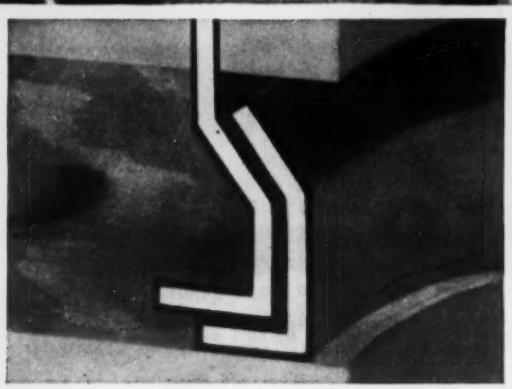
There's no steel that can't be leaded. Buyer preference will set not only the pattern for expansion, but the pace at which the expansion takes place.

CHEMICAL COMPOSITIONS OF LEADED STEELS

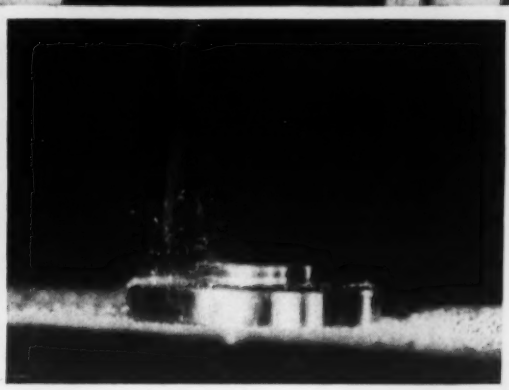
GRADE†	% C	% Mn	% P	% S	% Si	% Ni	% Cr	% Mo	% Pb
Ledloy—Grade A	0.15 max	0.75-1.25	0.04-0.09	0.25-0.35	0.10 max	.....	.....	.....	0.15-0.35
Ledloy—Grade B	0.15 max	0.85-1.35	0.04-0.09	0.36 min	0.10 max	.....	.....	.....	0.15-0.35
Ledloy Special 1018	0.15-0.20	0.60-0.90	0.04 max	0.05 max	.....	.....	.....	.....	0.15-0.35
Ledloy Special 1022	0.18-0.23	0.70-1.00	0.04 max	0.05 max	.....	.....	.....	.....	0.15-0.35
Ledloy Special 1026	0.22-0.28	0.60-0.90	0.04 max	0.05 max	.....	.....	.....	.....	0.15-0.35
Ledloy Special 1035	0.32-0.38	0.60-0.90	0.04 max	0.05 max	.....	.....	.....	.....	0.15-0.35
Ledloy Special 1045	0.43-0.50	0.60-0.90	0.04 max	0.05 max	0.15-0.30	.....	.....	.....	0.15-0.35
Ledloy Special 4140	0.38-0.43	0.75-1.00	0.04 max	0.04 max	0.20-0.35	.....	0.80-1.10	0.15-0.25	0.15-0.35
Ledloy Special 8620	0.18-0.23	0.70-0.90	0.04 max	0.04 max	0.20-0.35	0.40-0.70	0.40-0.60	0.15-0.25	0.15-0.35
Ledloy Special 8640	0.38-0.43	0.75-1.00	0.04 max	0.04 max	0.20-0.35	0.40-0.70	0.40-0.60	0.15-0.25	0.15-0.35
Ledloy Special 8642	0.40-0.45	0.75-1.00	0.04	0.04	0.20-0.35	0.40-0.70	0.55-0.75	0.08-0.15	0.15-0.35
*303 Pb (Stainless)	0.15 max	.....	0.04 max	0.08-0.12	1.00 max	8.0-10.0	17.0-19.0	.....	0.15-0.25

* Joslyn Mfg. & Supply Co., Ft. Wayne, Ind.

† In addition to the above grades, Copperweld Steel Co., Warren, O., will add lead to any of the standard SAE or AISI steels.



POSITIVE LABYRINTH. A joint is only as effective as its seal. Countless research studies have shown that the labyrinth is one of the most effective ways to seal a joint where at least one member rotates. Further sealing action is achieved by the film of grease that fills the minute clearance between the two seals.



FLINGER ACTION. One of the most important functions of the outer rotating seal is to throw off any foreign element that tries to enter the bearing. This flinger action is achieved by the centrifugal force set up by the rotating seal. Elements attacking the bearing are repelled.

Exclusive 4-way seal guards new Life-Line A bearing

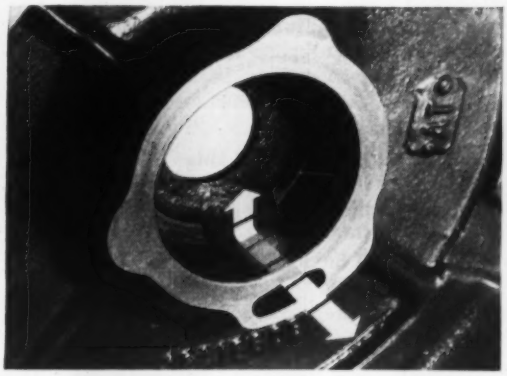
Here's why you can count on reliable Life-Line A motor performance

There are three factors that affect motor bearing life: (1) type of lubricant, (2) amount of lubricant, and (3) presence of contaminants. The one *sure* way to control all three is to use a bearing that is pre-lubricated at the bearing manufacturer's plant and then SEALED.

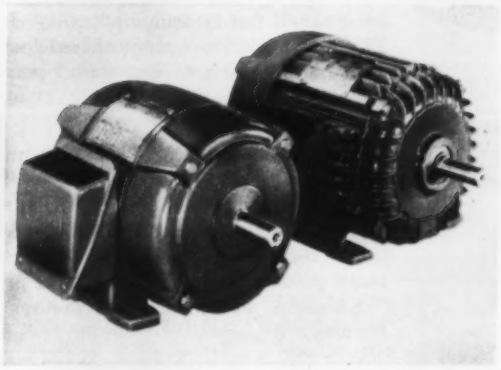
Many of the original Life-Line® pre-lubricated bearings installed in 1937 have been running ever since and are still like new. Now, Westinghouse offers another important step ahead... a pre-lubricated motor bearing that has *four* seals... two on each side. Here's real bearing protection. Grease is sealed in. Contaminants are sealed out. No on-the-job greasing is required—EVER.

This new concept in motor bearings is one of the many improvements Westinghouse has incorporated into the complete, balanced design system that makes the Life-Line "A" motor your best buy. Get all the facts from your local Westinghouse sales engineer. Or write for Booklet B-6154-A. Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21849

YOU CAN BE SURE... IF IT'S Westinghouse



AIR BY-PASS. Totally-enclosed motors "breathe" as the internal air expands and contracts with change in temperature. Ordinary motors "breathe" along the shaft and through the bearings. Life-Line provides an air by-pass around the bearings to keep out contaminating air.



The performance of any motor is dependent on the performance of each component of that motor. It takes balanced design. That's why every component in the new Life-Line "A" motor has been redesigned and integrated with the whole. The result is a motor with superior performance and consistent dependability.

another new—service-proved—

HARBISON-WALKER PRODUCT

semi-silica fireclay refractory of super-quality

For Soaking Pits	For Blast Furnace Stoves	For Open Hearth Regenerators	For Hot Metal Mixers	For Heating Furnaces

service

KAOSIL, having an added margin of the particular, beneficial properties of semi-silica fireclay brick is a truly unique refractory. The enhanced physical and chemical properties of KAOSIL extend the range of usefulness of the highly siliceous type of fireclay refractories.

composition

KAOSIL is made from exceedingly fine grained siliceous kaolin of exceptional purity and uniformity. Its silica content is approximately 75 percent and its content of basic oxides of alkalies and alkaline earths is phenomenally low—less than 1 percent.

superior characteristics

KAOSIL has exceptional stability under load in soaking heats of long duration.

Purity in composition of KAOSIL accounts for its high refractoriness and high temperature of vitrification.

The resistance of KAOSIL to structural spalling and fluxing by alkali laden gases are other properties of prime importance.

Excellent workmanship is assured by the power press method of forming.

HARBISON-WALKER REFRACTORIES CO.
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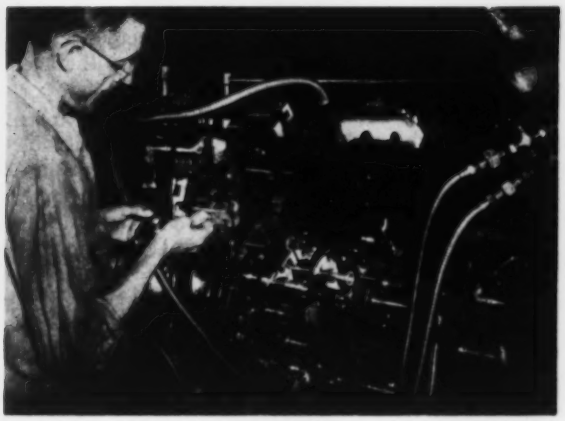
GENERAL OFFICES: PITTSBURGH 22, PENNSYLVANIA



Applications Increase as . . .

Leaded Steels Take Cut at Machining Costs

As they continue to solve machining problems, leaded steels broaden their own horizons. Producers cite the forging industry as a big potential user

DURING WORLD WAR II, British steelmaker Alan Macbeth, licensed to make leaded steels, offered Winston Churchill a wager—and won.

Terms of the bet: To break the production bottleneck on 20 mm shells, he (MacBeth) would supply 200 tons of leaded steel on a trial basis. If it didn't work out to everyone's satisfaction, he would make no charge for the steel. In addition, if the trial failed, he would donate a Spitfire fighter to the war effort.

Mr. Macbeth Won—Leaded steel broke the production tie-up and it's been used almost exclusively for this part ever since.

Cold Facts—Little doubt remains that lead in steel improves the performance of that steel when it's machined (see STEEL, Jan. 11, p. 70). Applications in machine shops show that how you benefit depends on what you're looking for: Faster production, longer tool life, better finish, etc.

About a year and a half ago, J. J. Tourek Mfg. Co., Chicago, started looking for help on their standard line of pipe plugs. Trouble with inclusions, etc., drove them to try leaded steels. As one executive puts it: "With less than 100 per cent inspection, we're forced to gamble on the quality of steel we use."

Winner—Their gamble on leaded steels paid off. Rejects were cut drastically; production went up more than a third with the same tool life. Increase in production alone, they say, more than paid the premium on leaded steel.

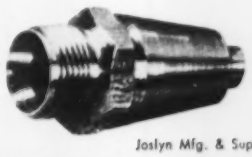
An unexpected gain was in ductility. While producers of leaded steels make no claims for any change other than machinability, it's possible that in the switch from Bessemer screw stock, ductility is improved. This helps on pipe plugs since the threads will squeeze to a tight, leakless fit.

Job Reduction—On another part that Tourek is making for a customer, they compared leaded 8620 with nonleaded. Leaded stock permitted faster speeds (110 to 120 sfm instead of 90 to 100) with about the same tool life.

Big savings came when the machined surface finish was so smooth, they could completely eliminate a later grinding operation.

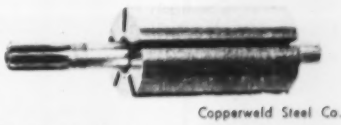
And More—Results at Tourek are typical of those at other ma-

Pipe plugs are made from leaded steel at J. J. Tourek Mfg. Co., Chicago. Production rates are up, and rejects are cut. Production gains alone paid for switch to leaded steel



Joslyn Mfg. & Supply Co.

Spray nozzle part is machined from leaded 18-8 stainless steel. Part is about 1 in. long. Speeds were jumped from 130 to 215 sfm when they used leaded stock. Production increased from 16 to 24 pieces an hour



Copperweld Steel Co.

This rotor for a pneumatic impact wrench is cut from ⅞-in. round cold drawn leaded 8620. Leaded steel has given 25 per cent production increase on this part. Saw life on radial slots was 18 pieces with frequent breakage—now it's 60 pieces

Leaded grade 1020 is used for steam condenser baffle plates at Allis-Chalmers Mfg. Co., Milwaukee. In a typical condenser, there may be more than a total of 15,000 holes

chine shops. Increases in production and/or tool life of from 15 to 30 per cent are run of the mill.

As a wider variety of leaded steels becomes available, and as more people try them, applications diversify. Champion Spark Plug Co., Toledo, O., is buying Ledloy in hot-rolled bars and is cold drawing it as needed. They're using it for spark plug shells and are "well pleased with the results." Operations include drilling, forming, knurling, marking and threading.

Leaded 303 stainless is being used on a spray nozzle (see illustration); production is up 50 per cent on the first operation and 43 per cent on the second. No change in tool life was reported, and finish is excellent. Leaded stainless (Joslyn Mfg. and Supply Co.'s 303 Pb) is also used for making taper pins. Since it's been on the job, production is up 45 per cent and tool life has been quadrupled, using straight 18-8 stainless as a comparison.

Plates — Although most of the leaded steel is sold as bars, Allis-Chalmers Mfg. Co., Milwaukee, has been using leaded steels in steam condenser steady plates for nearly a decade. It reduces drill and ream time with resultant lower labor costs. They claim it makes possible a smoother, truer hole than nonleaded steel. Grade is leaded 1020.

Where To?—Apparently there's nothing unusual about any of these jobs. For every one mentioned, there are fifty more equally successful. Then, where do we go from here?

Screw machine shops, of course, will continue to be the largest single group of leaded steel users. In addition, producers see a big potential market for leaded steels in forgings. Copperweld Steel Co. already reports substantial sales of hot-rolled bars to forge shops. Inland, too, is focusing attention on forge shops.

For example, two Michigan forge shops are forging wheel hubs for the automotive industry. There is, apparently, little difference in forgeability, and no modifications in forging practice are necessary. And when the forgings are machined, they get the same improvement in machinability as is obtained in leaded steel bars.

Rules — Consideration of leaded steel on your job will depend on these points: Is the machining cost critical enough to justify a premium steel? Can your machines be used at higher spindle speeds and/or feeds? Will an improved surface finish solve one of your production problems?

There's one more point to consider. While lead additions make no change in physical properties of a steel, you may be able to get improved physicals on a job by substituting a leaded alloy steel (with properties of the nonleaded alloy) for a carbon grade, and get about the same machinability as you had on the carbon steel.

At the Charles City, Iowa, plant

CUTTING SPEEDS AND FEEDS FOR STANDARD TOOLS

TOOL NAME	Size of Hole Inches	Width or Depth of Cut, Inches Width	Leaded Carbon Steel Speed s.f.m.	Leaded Carbon Steel Feed In./Rev.	Leaded 4140 Annealed Speed s.f.m.	Leaded 4140 Annealed Feed In./Rev.
Form,		.500	300	.003	150	.0022
Circular		1.000	280	.0025	145	.0018
or		1.500	280	.0025	145	.0016
Dove-		2.000	270	.0018	141	.0014
Tail		2.500	260	.0015	136	.0011
	.250		165	.0054	95	.0041
Twist	.500		165	.006	95	.0045
Drills	.750		185	.007	105	.0055
	1.000		185	.008	105	.0064
	1.250		195	.009	109	.0073
		Depth				
Box		.125	300	.0085	150	.0064
Tool		.250	280	.008	145	.0059
Blades		.375	270	.0065	141	.0050
		.500	260	.0055	136	.0041
		.062	260	.012	136	.0091
Hollow		.125	250	.0096	127	.0073
Mills		.187	240	.0084	123	.0064
		.250	230	.0073	118	.0059
Knurl Tools in Turret	On		300	.020	150	.014
	Off		300	.040	150	.028
Knurl Cross Slide			300	.020	150	.014
Chamfer & Facing			305	.008 to .010	182	.0045 to .0064
Reamers	under ½"		240	.0085	132	.0064
	½" or over		240	.012	132	.0091
		Width				
		.062	250	.003	150	.0018
Cut Off		.125	255	.0035	160	.0023
		.187	260	.0035	164	.0023
		.250	275	.004	173	.0027

Source: Joseph T. Ryerson & Son Inc., Chicago.

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THE POND THAT FLEW AWAY!

As a boy up in northern Wisconsin was bringing in the cows not long ago, he noticed the pond in back of the barn was literally covered with wild geese. Once the cows were in the barn, he ran back to the house to get his gun, but his Dad said, "Nothing doing, son, those geese will be there in the morning. Right now we're going to milk."

Next morning, at the crack of day, the lad went out with his old 10-bore, and he sneaked up to a ridge close to the pond. Sure enough, the geese were there all right. It had turned cold over night, and their feet were frozen in the ice. The boy walked openly and slowly in sight, figuring he had them all. But when the old gander, who led the flock, spotted him, he "honked" loudly to alert the flock. Then he flapped his wings a couple of times to give them the beat. The old fellow honked again as a signal, and all the geese began to flap their wings in time with his. Before the lad's eyes he saw them take off, carrying away the pond.

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Next time you need dolomite, specify Baker's MAGDOLITE, you'll find, as other steel producers have, your refractory costs lower, your furnace efficiency increased, and more uniform ingots produced.

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MAKERS OF BAKER'S MAGDOLITE

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Plants: Billmeyer, York, Pennsylvania—Millersville, Ohio

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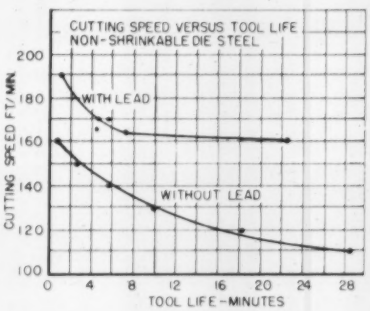
of Oliver Corp. they substituted leaded 4140 for straight C 1141 on a power takeoff shaft. Machinability is comparable, but the leaded steel shafts have been fatigue and torsion tested through 50,000 cycles without failure. Life of the nonleaded C 1141 shafts was about 19,000 cycles.

Tool Steels—Tool and die makers also are showing interest in steels with free machining characteristics. Their availability would, in some cases, markedly lower total costs of the tools and dies.

Although one manufacturer has made a leaded die steel since 1947, availability has not been sufficient for general use of leaded tool or die steels. Now, however, more grades are being leaded and are available for general use.

Example — In some instances wear-resistant steels have been avoided for tools and dies; simply because the machining was so tough and the resultant cost so high, their use was unfeasible. As they become available in a leaded state, wear resistant steels may well expect a widening market.

The accompanying curves compare the machinability of leaded manganese oil hardening steel



Machinability of leaded vs. nonleaded oil-hardening tool steel. Tests are based on Nonshrinkable Colonial #6 FM, from Vanadium-Alloys Steel Co.

versus the same steel nonleaded. They indicate a permissible increase in cutting speeds of 35 per cent. Or, at the same speed, an increase in tool life.

Another important point on free-machining tool and die steels is the reduction of machining stresses. This suggests the possibility that less movement during hardening will be experienced.

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(*Continued from p. 148*)

American Welding Society

F. L. Plummer
President

Monday, Nov. 1

Chairman—F. L. Plummer, President, AWS
Co-Chairman—H. C. Boardman, Chairman, Technical Papers Committee

Louis XVI Room
10 a.m.—Prize Awards
10:30 a.m.—Adams Lecture

Toughness of Weldability
William L. Warner,
Watertown Arsenal

Monday, Nov. 1—2 p.m.

Two Simultaneous Sessions

Resistance Welding (Ballroom)

Flashwelding High-Strength Steels—W. G. Fassnacht, Bendix Aviation Corp.

Effect of Post Treatment on the Properties of Flash Welds—Ernest F. Nippes, Warren F. Savage, Gordon Grotke and S. M. Robelotto, Rensselaer Polytechnic Institute.

Effects of Prestressing on Strength Characteristics of Spot Welds in 17-7 Stainless Steels Under Cyclic Loads—V. N. Krivohok, International Nickel Co., and J. A. Choquet and G. Welter, Ecole Polytechnique.

Weldability (Assembly Room)

Effect of Microstructure on Notch Teughness—Part II—John H. Gross and Robert D. Stout, Lehigh University.

Impact Testing Weld Metal and Heat-Affected Zone Simultaneously—W. P. Hatch Jr., and C. E. Hartbower, Watertown Arsenal.

Applicability of Charpy Test Data, Peter P. Puzak, Martin E. Schuster and W. S. Pellini, Naval Research Laboratory.

Monday Evening, November 1

6 p.m.—President's Reception
Crystal and Louis XVI Rooms

8 p.m.—National Dinner
Bal Tabarin

Tuesday, Nov. 2—9:30 a.m.

Three Simultaneous Sessions

Weldability (Assembly Room)

Isothermal Studies on Weld-Metal Microcracking in Mild Steel—Alan E. Flanigan and Z. P. Saperstein, University of California.

Crack-Starter Tests of Ship Fracture

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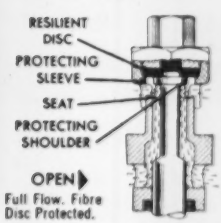

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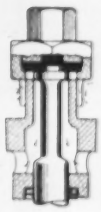
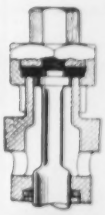
CLOSING OR OPENING



Flow practically stopped by close fitting sleeve and stem shoulder, before seat and disc make contact. This prevents "wire drawing." Trapped water cushions closing, dampens hydraulic shock.

CLOSED



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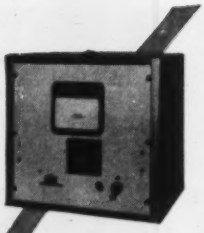

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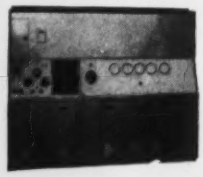

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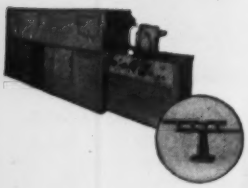

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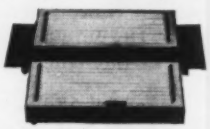

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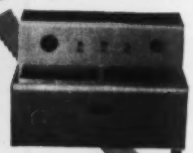

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AWS PROGRAM . . .

and Project Steels—P. P. Puzak, Martin E. Schuster and W. S. Pellini, Naval Research Laboratory.

Continuous Cooling Transformation Characteristics of Three Types of Weld Metal—E. F. Nippes and E. C. Nelson, Rensselaer Polytechnic Institute.

Resistance Welding (Crystal Room)

Spot Welding Aluminum with Single-Phase Equipment—J. W. Kehoe and D. R. McCutcheon, Westinghouse Electric Corp.

Seam Welding Low-Carbon Steel—M. I. Bergeman and Gene C. Walker, University of Texas.

Automatic Percussion Welding—A. L. Quinlan, Western Electric Co.

Shielded Arc Welding (Louis XVI Room)

Recent Developments in Contact Electrodes—D. L. Mathias, Acrods Corp.

Electrodes With Powdered Metal Coatings. A Progress Report—Jerry Hinkel, Lincoln Electric Co..

Metallic Rectifiers for Arc Welders—G. K. Willecke, Miller Electric Mfg. Co.

Tuesday Afternoon, Nov. 2—2 p.m.

Section Officers Meeting
Crystal Room

Tuesday Afternoon, Nov. 2—2 p.m.

Two Simultaneous Sessions

Weldability (Assembly Room)

Arc Welding Embrittlement of Powder Metals—Albert Sill Jr., and C. C. Mathias, Sperry Corp.

Weldability of Wrought, High-Alloy Materials—R. P. Culbertson, Haynes Stellite Co.

Surfacing (Louis XVI Room)

High Nickel Alloy Overlays on Ferrous Metals—George R. Pease, H. B. Bott and H. C. Waugh, International Nickel Co.

The Inert Gas Metal Arc Overlay Process—C. R. Felmley, Air Reduction Sales Co. Inc.

Automatic Hard Surfacing in the Mining and Construction Industries—I. R. Bartter, Automatic Welding Co.

Wednesday Morning, Nov. 3—9:30 a.m.

Three Simultaneous Sessions

Aircraft and Rocketry (Crystal Room)

Production of High-Strength Aluminum Alloy Rocket Motor Tubing by Means of an Induction Weld Tube Mill—W. S. Tenner and H. C. Wheeler, U. S. Naval Ordnance Test Station.

Metallurgical Aspect of Welding Precipitation Hardening Stainless Steels—C. W. Funk and M. J. Granger, Aerojet-General Corp.

The Macro Etch System of Evaluating Quality of Resistance Welding—D. O. Samuelson and F. G. Harkins, Solar Aircraft Co.

Titanium, Zirconium and Molybdenum (Louis XVI Room)

Notch Toughness of Weld Deposits in Titanium Plate—D. M. Daley Jr., and C. H. Hartbower, Watertown Arsenal.

The Welding of Zirconium—Ralph V. Hilkert and Harold H. Hollenbeck, Titanium Alloy Mfg. Division, National Lead Co.

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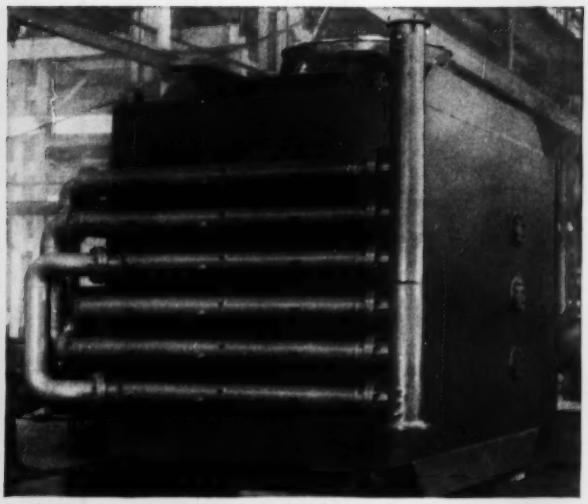

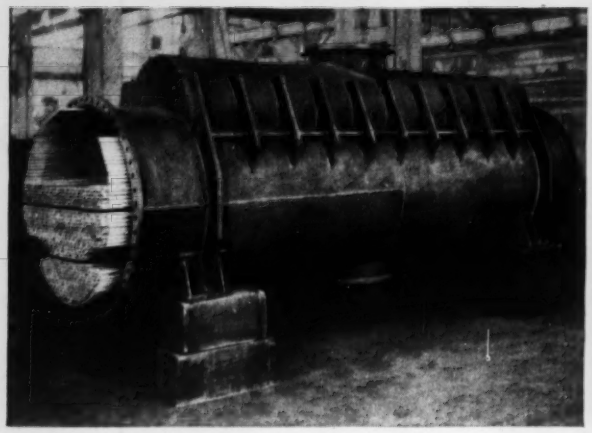

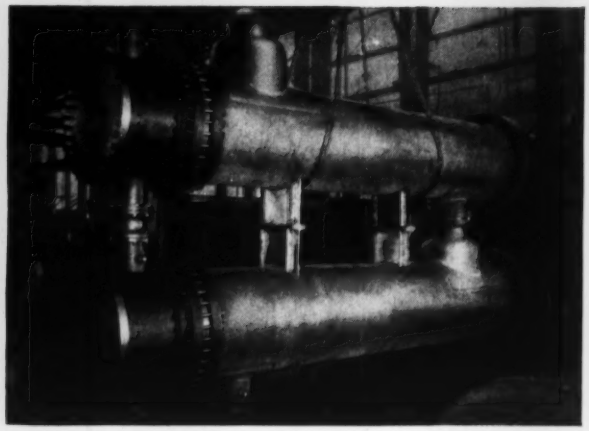

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AWS PROGRAM . . .

ing of Molybdenum—Timothy G. Perry, H. Stephen Spacil and John Wulff, Massachusetts Institute of Technology.

Inert Arc Welding (Assembly Room)

New Techniques in Inert-Gas-Shielded Metal-Arc Welding—R. W. Tuthill, General Electric Co.

Inert Gas Welding of Stator Packs—F. J. Pilia, Linde Air Products Co.

A Production Application of Inert-Gas-Shielded Metal-Arc Welding of Mild Steel—John L. Lang, Lukenweld Division, Lukens Steel Co.

Wednesday Afternoon, Nov. 3—2 p.m.

Three Simultaneous Sessions

Pressure Vessels and Piping (Assembly Room)

The Plastic Fatigue Behavior of High-Strength Pressure Vessel Steels—John H. Gross and Robert D. Stout, Lehigh University.

Further Studies of the Biaxial Fatigue Properties of Pressure Vessel Steels—C. E. Bowman and T. J. Dolan, Department of Theoretical and Applied Mechanics, University of Illinois.

Automatic Tungsten-Inert-Arc Welding of Pipes in Position, Without the Use of Backing Rings—L. C. McNutt, Benjamin F. Shaw Co.

Brazing (Crystal Room)

Silver Brazing of Refractory Metals—C. H. Chatfield, Handy & Harman.

Filler-Metal Strengths in Brazed Copper Joints—W. H. Munse and D. C. Crawford, University of Illinois.

Investigation of the Factors Determining the Tensile Strength of the Brazed Joint—Nikolajs Bredzs, Armour Research Foundation, Illinois Institute of Technology.

Symposium on Fused Metallized Coatings (Louis XVI Room)

Fundamentals of Fused Metallized Coatings—Bela Ronay, U. S. Naval Engineering Experimental Station.

Practical Applications of Fused Self-fluxing Metallized Coatings—Harvey S. Miller, New England Hardfacing Co.

Practical Applications of Fused Non-self-fluxing Metallized Coatings—Sam Tour, Sam Tour & Co. Inc.

Wednesday Evening, Nov. 3—6:30 p.m.

WRC University Dinner (Emerald Room)

8 p.m. WRC University Conference (Crystal Room)

Thursday Morning, Nov. 4—10 a.m.

Board of Directors Meeting (Jade Room)

Thursday Morning, Nov. 4—9:30 a.m.

Three Simultaneous Sessions

Aircraft (Crystal Room)

Considerations for Fatigue in Aircraft Welding Design—J. Koziarski, Piasecki Helicopter Corp.

Properties of Welds in Al-Mg-Mo Alloys XK186 and XK183—D. A. Cook and S. L. Channon, Kaiser Aluminum and Chemical Corp. and A. R. Hard, State College of Washington.

High-Temperature Alloy Brazing of Thin Materials for Jet Engines—A. S. Rose and W. N. Lewis, I-T-E Circuit Breaker Co.

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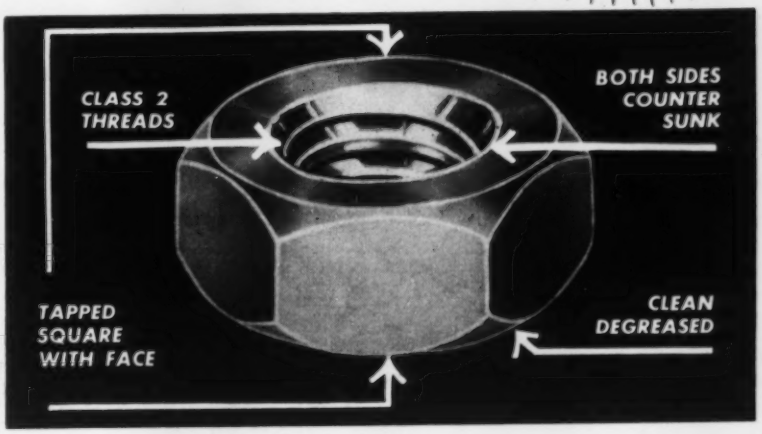

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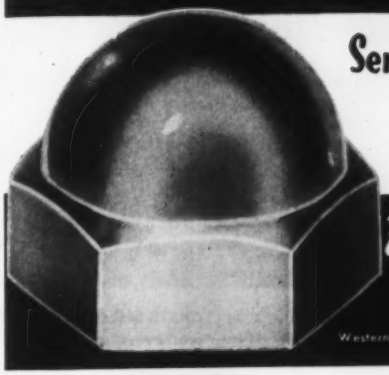

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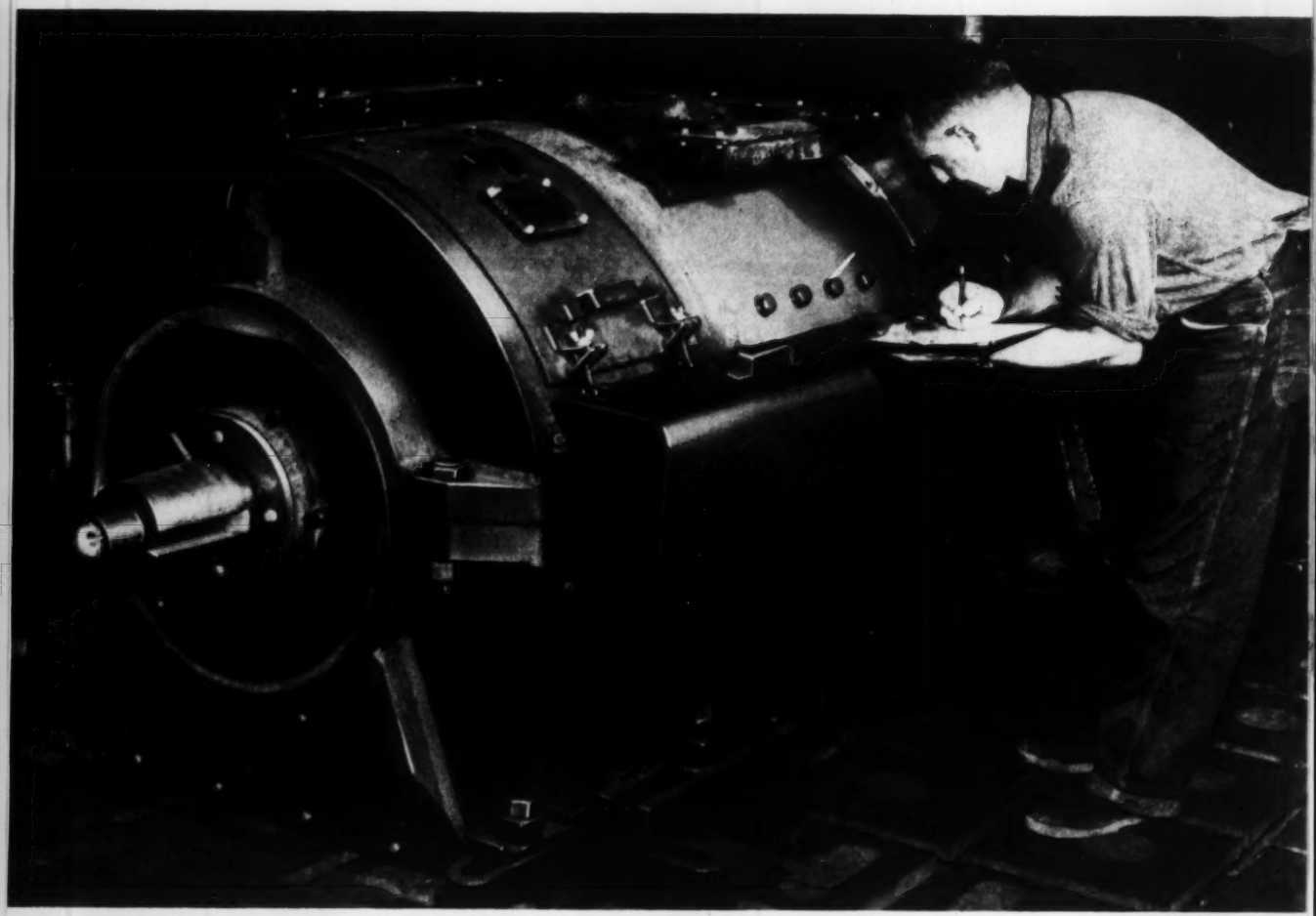
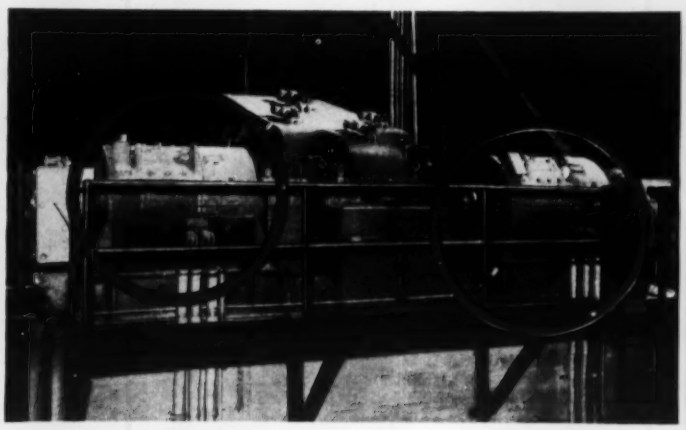
NEW G-E Armored Mill Motor—



TO ASSURE YOU of dependable service, this MD-622 is undergoing the rigid tests given to all G-E Armored Motors before shipment.

POWER SHOVEL equipped with compact G-E Type MD motors which have high overload capacity and the ability to take the terrific shocks of excavating duty.



SLAB SHEAR in reversing, blooming and slabbing mill is typical of severe applications in the steel industry that are dependably powered by G-E armored motors.

Most Powerful in its Class

Another G-E "first"—the MD-622—gives you more horsepower and torque than any other mill motor!

POWER-PLUS for the toughest heavy-duty application—that's the job of the MD-622—General Electric's latest addition to the MD-600 Armored Motor line.

AISE OBJECTIVES set up for smaller motors of this type, are met in the construction of the MD-622, which gives you more horsepower, increased commutating ability and better speed regulation in the same mounting dimensions as the earlier motor. Designed for duty in steel mills, power shovels, mine operations, dredges and ore bridges, it's ideal for extra torque, high momentary loads and snappy reversals.

RATED 500 HP AT 350 RPM when force ventilated, this motor delivers more torque relative to its size than any other mill motor ever built.

BETTER SPEED REGULATION can be maintained at higher speeds than in previous motors—and maximum safe speed is 20% higher.

WIDER SPEED RANGE is possible with the adjustable speed MD-622 and stabilizing series windings are not required, simplifying control on reversing operations.

REDUCED MAINTENANCE due to integral feet on armature. Out of frame, it stands by itself. Armature spider allows replacement of shaft without disturbing windings.

FOR NEW BULLETIN on MD-600 motors, fill out the coupon below. If you need more information, contact your nearest G-E Apparatus Sales Office. General Electric Co., Schenectady 5, N. Y.

Please send Bulletin GEA-4654C, "DC Armored Motors," which gives the complete story on the MD-600 line with examples of their reliable performance throughout industry.

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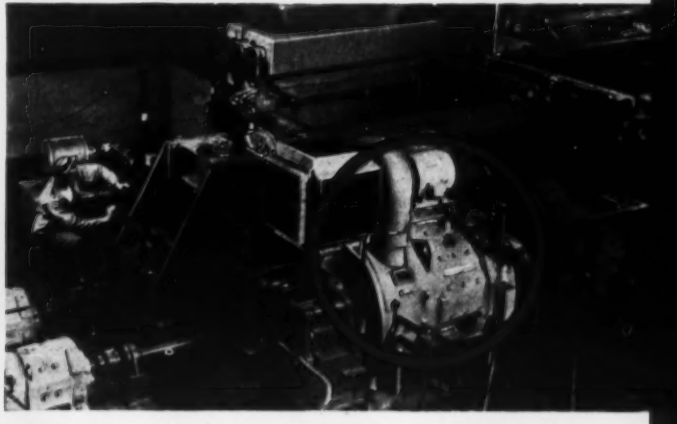

COILER in hot strip mill driven by force ventilated G-E armored motor with extra horsepower and mechanical strength to withstand severe operating conditions.

"Thinness Control" means that the decimal thickness of each sheet is uniform throughout the length and width.

Job costs are figured on a square foot basis while stainless steel is purchased on a weight basis. When stainless steel is ordered by gauge number the permissible A.I.S.I. thickness variation is plus or minus 10%. If you receive material on the heavy side of the gauge range you are paying a premium for stainless surface area. For example, if you order 18 gauge, you may receive sheets .052" thick, when a thickness of .0475" would suit your purpose. On a standard 18 gauge sheet (36"x120") each .001" in thickness weighs 1.26 pounds per sheet. In this example, each stainless sheet could weigh as much as 5.67 pounds more than required. You can readily see the advantages of specifying stainless rolled to the light side of the gauge range. MicroRold stainless is rolled to exceptionally close tolerances, as low as 3% average (plus or minus). Regular use of MicroRold provides more stainless area per ton or the equivalent area with lesser weight.

If you are not now a user of MicroRold sheet it will pay you to get the full details. Your steel distributor will gladly tell you the MicroRold story.

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AWS PROGRAM . . .

Design and Production

(Assembly Room)

Prediction of Angular Distortion Caused by One-Pass Fillet Welding —T. Kumose, T. Yoshida, T. Abbe and H. Onoue, Yokohama Shipyard & Engine Works, Mitsubishi Nippon Heavy-Industries, Ltd.

Triaxial Tensile Stresses in Arc Welded Mild Steel—Harry E. Kennedy, University of California.

Automatic Welding Builds Railroad Cars—H. D. Hollis, Texas & Pacific Railway Co.

Cutting (Ballroom)

Oxygen Cutting With Iron Powder and Chemical Flux Additives—R. L. Deily and J. R. Kirwin, Air Reduction Sales Co.

Sigma Arc Cutting—R. S. Babcock, Linde Air Products Co.

Improved Method of Oxy-Fuel Gas Combustion—Edward H. Roper, Air Reduction Sales Co.

Thursday Afternoon, Nov. 4— 2 p.m.

Business Meeting (Crystal Room)

Friday Morning, Nov. 5— 9:30 a.m.

Three Simultaneous Sessions

High-Temperature Materials

(Assembly Room)

An Investigation of the Hot Ductility of High-Temperature Alloys—Ernest F. Nippes, Warren F. Savage, H. F. Mason and B. J. Bastian, Rensselaer Polytechnic Institute.

Interpreting Graphitization in High-Temperature, High-Pressure Steam Piping—H. Thielsch, E. M. Phillips and E. R. Jerome Jr., Grinnell Co. Inc.

The Welding of Type 347 Stainless Steel for the Higher Steam Turbine Operating Temperatures—R. M. Curran and A. W. Rankin, General Electric Co.

Structural (Ballroom)

Behavior of Welded Single Span Frames Under Combined Loading —C. G. Schilling, F. W. Schutz Jr., and L. S. Beedle, Fritz Engineering Laboratory, Lehigh University.

Fatigue Strength of Butt Welds in Structural Steels—L. A. Harris, G. E. Nordmark and N. H. Newmark, Talbot Laboratory, University of Illinois.

New Concepts in Spot X-Ray of Welded Structures—Harold Hovland, industrial x-ray engineer.

Applications (Old Chicago Room)

How to Apply Semiautomatic Submerged Arc Welding—Robert A. Wilson, Lincoln Electric Co.

Mechanized Flame Descaling, Dehydrating and Priming of Prefabricated Plate—C. H. Cowan, Avondale Marine Ways Inc., and J. R. Kirwin, Air Reduction Sales Co.

Automatic Hardfacing with Mild Steel Electrodes and Agglomerated Alloy Fluxes—J. S. McKeighan, Lincoln Electric Co.

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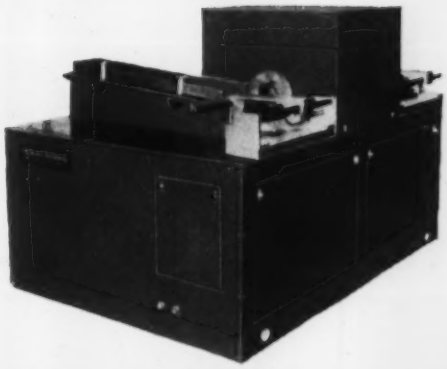

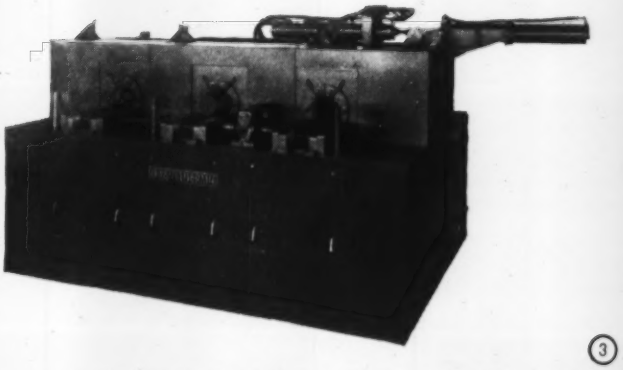

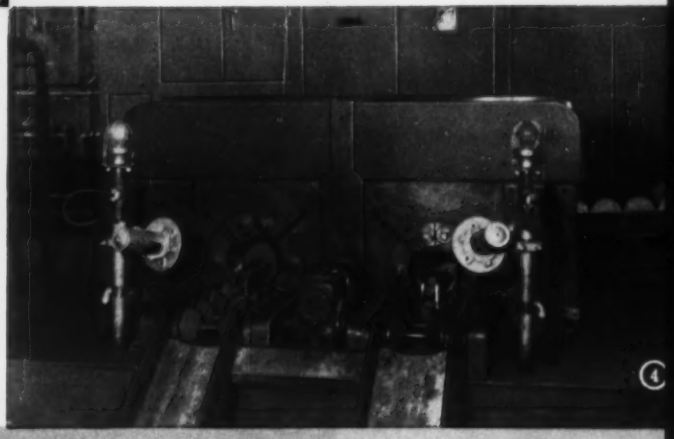

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Copper or brass billets are heated in two or three minutes with a Magnethermic . . . as compared with hours by other methods. Speed is not the only advantage of induction heating. You eliminate need for scheduling billets ahead of time since a Magnethermic does not require warm-up time. Press the button and a hot billet will be ready in minutes. Maintenance is limited to coil repair (changed in 10 minutes or relined in less than two hours) as compared to furnace relinings requiring days.

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5. The design is the result of long experience. The casting has been seasoned, machined and scraped with meticulous care.

6. The Levels are made in two sizes, 18-inch and 27-inch, which covers the requirements for leveling all types of machines.

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Sunday, Oct. 31—4:30 p.m.
IMD Publications Committee Meeting
W. R. Hibbard Jr., Chairman

Sunday, Oct. 31—8 p.m.
IMD Program Committee Meeting
D. J. Blickwede, Chairman

Monday, Nov. 1—9:30-12 a.m.
Ballroom
Deformation
W. A. Backofen, Chairman

Preferred Orientation of Cold Rolled Uranium Foil—W. Seymour, General Electric Co.

Mechanism of Ortho Kink-Band Formation in Compressed Zinc Monocrystals—J. J. Gilman, General Electric Co.

Strain Hardening of Latent Slip Systems in Zinc Crystals—E. H. Edwards, Standard Oil Co. of California and J. Washburn, University of California.

Effects of Temperature on Deformation of Beta Brass—C. S. Barrett, University of Chicago.

Quantitative Substructure and Tensile Property Investigations of Nickel Alloys—E. R. Parker and B. Ancker, University of California.

Stress-Strain Characteristics and Slip Band Formation in Metal Crystals—F. C. Rosi, RCA Laboratories.

Monday, Nov. 1—9:30-12 a.m.
Cotillion Room
Constitution
S. C. Carapella Jr. and B. D. Cullity, chairmen

Columbium-Vanadium Alloy System—H. A. Wilhelm, O. N. Carlson and J. M. Dickenson, Iowa State College.

Solid Solubility of Oxygen in Columbium—A. U. Seybolt, General Electric Co.

Solubility of Oxygen in Alpha Iron—A. U. Seybolt, General Electric Co.

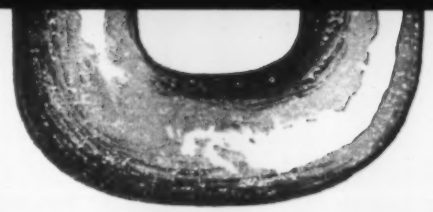
Precipitation of Iron Oxide from Alpha-Iron-Oxide Solid Solutions—A. U. Seybolt, General Electric Co.

Chromium-Rich Portion of the Chromium-Nickel Phase Diagram—Charles Stein and N. J. Grant, Massachusetts Institute of Technology.

Effect of Nitrogen on Sigma Formation in Nickel-Chromium Steels at 1200° F—G. F. Tisinai, J. K. Stanley and C. H. Samans, Standard Oil Co. of Indiana.

Monday, Nov. 1—2:00-5:00 p.m.
Diffusion
J. H. Keeler and R. W. Baluffi, Chairmen

Mobilities in Diffusion in Alpha Brass



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LINK in
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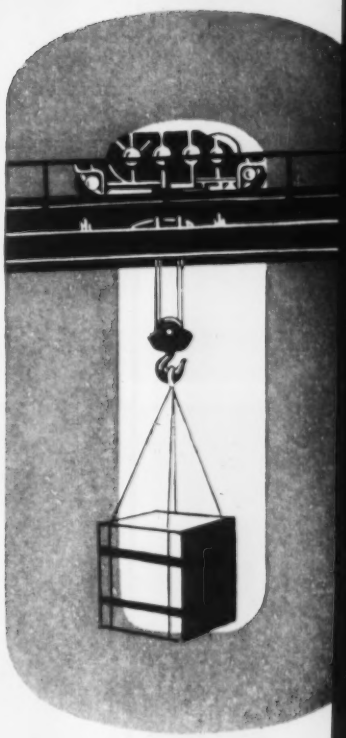

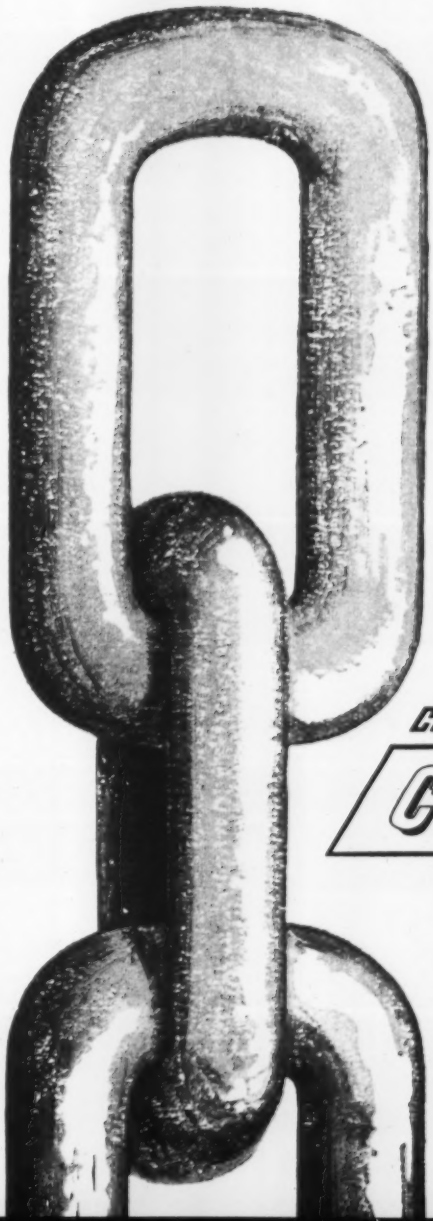

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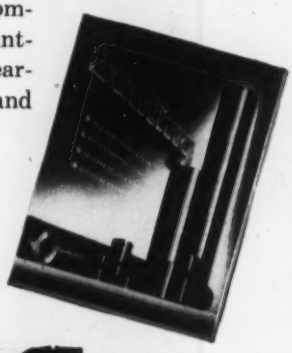

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AIME PROGRAM . . .

—G. T. Horne and R. F. Mehl, Carnegie Institute of Technology.

Self Diffusivity Along Edge Dislocation Singular Lines in Silver—A. H. Hendrickson and E. S. Machlin, Columbia University.

Rate of Self-Diffusion in Polycrystalline Magnesium—P. G. Shewmon and F. N. Rhines, Carnegie Institute of Technology.

Determination of the Self-Diffusion Coefficients of Gold by Autoradiography—H. C. Gatos, E. I. du Pont de Nemours and Co. Inc., and A. D. Kurtz, Massachusetts Institute of Technology.

Cation Self-Diffusion in Wustite and Cobaltous Oxide and an Examination of the Decrease of Surface Activity Method of Measuring Self-Diffusion Coefficients—R. E. Carter, Department of Mines and Technical Surveys, Canada and F. D. Richardson, Imperial College of Science and Technology, England.

Solution Rate of Solid Aluminum in Molten Aluminum-Silicon Alloy—C. M. Craighead, E. W. Cawthorne and R. I. Jaffee, Battelle Memorial Institute.

Monday, Nov. 1—2-5 p.m.

Ballroom

Powder Metallurgy and Oxidation

A. J. Shaler, chairman

Electron Optical Study of the Initial Stages of Oxidation of High-Purity Iron at Oxygen Pressures of 0.1 to 2 Microns of Hg Between 650° to 850° C—W. A. McMillan, K. F. Andrew and E. A. Gulbransen, Westinghouse Research Laboratories.

High Pressure Oxidation of Metals . . . Tantalum in Oxygen—R. C. Peterson, M. E. Wadsworth and W. M. Fassell, Jr., University of Utah.

Warm Pressing of Beryllium Powder—N. P. Pinto, Sylvania Electric Products Inc.

Influence of Additives in the Production of High Coercivity of Ultra-Fine Iron Powder—G. P. Conard II, E. W. Stewart and J. F. Libsch, Lehigh University.

Monday, Nov. 1—4:30 p.m.

Membership Committee Meeting

J. P. Nielsen, chairman

Monday, November 1—8 p.m.

Ballroom

Metal Science

The special session on "Invited Papers in Metallurgical Science" is designed to bring to IMD attention timely advances in metallurgical science not available through institute publications.

J. H. Hollomon and Bruce Chalmers, chairmen

Precipitation Out of Dual Solid Solutions of Carbon and Nitrogen in Iron—C. Wert, University of Illinois.

Creep of Silver Bromide at High Temperatures—R. W. Christy, Dartmouth College.

The Effect of Relative Crystal and Boundary Orientations on Grain Boundary Diffusion Rates—D.

announcing

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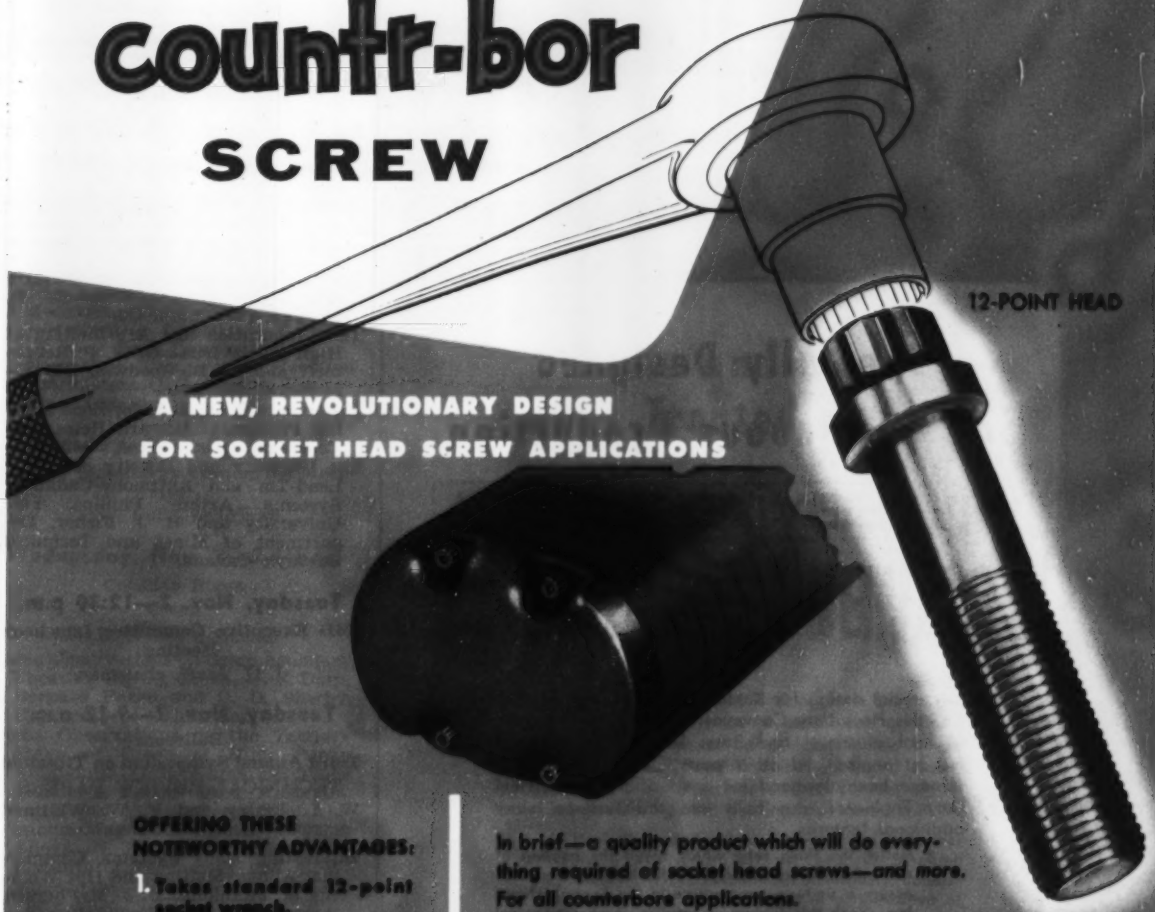
SCREW



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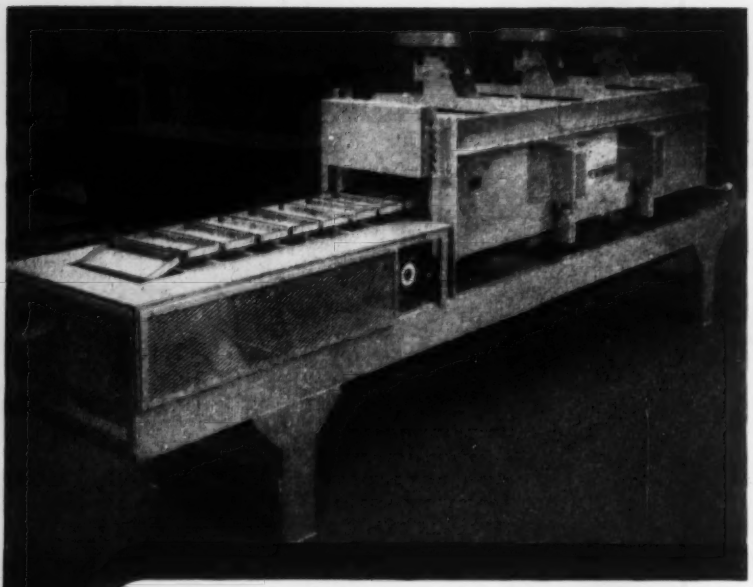

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AIME PROGRAM . . .

Turnbull and R. E. Hoffman, General Electric Co.

Effect of the Structure of Dislocation Boundaries on Yield Strength—J. Washburn, University of California.

Tuesday, Nov. 2—9-12 a.m.

Cotillion Room

General

Howard Scott and Paul Gordon, chairmen

Influence of Carbon and Manganese on the Properties of Semikilled Hot Rolled Steel—F. W. Boulger and R. H. Frazier, Battelle Memorial Institute.

Temper Embrittlement of 5140 Steel—S. A. Bush and C. A. Siebert, University of Michigan.

The Coefficients of Thermal Expansion of Zirconium—R. B. Russell, Massachusetts Institute of Technology.

Physical and Mechanical Properties of Rhenium—C. T. Sims, C. M. Craighead and R. I. Jaffee, Battelle Memorial Institute.

The Ferro Magnetism of Certain Manganese Rich Alloys—E. R. Morgan, Ford Motor Co.

The Preparation and Arc Melting of High Purity Iron—G. W. P. Rengstorff and H. B. Goodwin, Battelle Memorial Institute.

Mathematical Methods for Zone Melting Processes—Howard Reiss, Bell Telephone Laboratories.

The Viscosity and Density of Liquid Lead-Tin and Antimony-Cadmium Systems — Arthur Phillips, Yale University and H. J. Fisher, Department of Mines and Technical Surveys, Canada.

Tuesday, Nov. 2—12:30 p.m.

IMD Executive Committee Luncheon Meeting

J. H. Scaff, chairman

Tuesday, Nov. 2—9-12 a.m.

Ballroom

Third Annual Symposium on Titanium

TECHNICAL REVIEW PAPERS

W. L. Finlay and V. W. Whitmer, chairmen

Interesting Alloy Systems, Commercial Alloys, Melting and Hot Working of Titanium—D. J. McPherson, Armour Research Foundation, Illinois Institute of Technology.

General Physical Metallurgy, Including Effects of Interstitials, Heat Treatment and Joining of Titanium—R. I. Jaffee, Battelle Memorial Institute.

Hydrogen in Titanium—Harold Kessler, Titanium Metals Corp. of America.

Use of Titanium in Airframes—Gordon Fairbairn, North American Aviation Inc.

Use of Titanium in Aircraft of the Future—N. E. Promisel, Navy Department, Bureau of Aeronautics.

Tuesday, Nov. 2—2-5 p.m.

Ballroom

Third Annual Symposium on Titanium (Continued)

PANEL DISCUSSION

W. A. Dean and L. D. Jaffee, chairmen

AIME PROGRAM . . .

Panelists:
L. A. Best, Douglas Aircraft Co.
L. R. Frazier, General Electric Co.
T. W. Lippert, Titanium Metals Corp. of America.
Frank Vandenburgh, Mallory-Sharon Titanium Corp.
Major R. J. Kotfila, Wright-Patterson Air Force Base.
J. B. Sutton, E. I. du Pont de Nemours & Co. Inc.

Tuesday, Nov. 2—2-5 p.m.

Cotillion Room

Phase Transformations and Recrystallization

E. S. Machlin and J. K. Stanley, chairmen

On the Nucleation of Pearlite—M. E. Nicholson, University of Chicago.
Some Characteristics of the Isothermal Martensitic Transformation—B. I. Averbach, C. H. Shih and Morris Cohen, Massachusetts Institute of Technology.
Ordering Reaction of the Cu4 Pd Alloy—A. H. Geisler and J. B. Newkirk, General Electric Co.
A Mechanism for the Origin of Recrystallization Nuclei—J. P. Nielsen, New York University.
A New High Temperature Reaction Calorimeter—O. J. Kleppa, University of Chicago.

Tuesday, Nov. 2—4 p.m.

Nuclear Metallurgy Committee Meeting

D. W. Lillie, chairman

Wednesday, Nov. 3—2-5 p.m.

Cotillion Room

Creep

H. E. Howe, chairman

Some Observations on Grain boundary Shearing During Creep—J. E. Dorn, Bernard Fazen and O. D. Sherby, University of California.
Some Observations on the Tertiary Stage of Creep of High Purity Aluminum—G. R. Wilms, Reference Standards Laboratories, Australia.
Creep Rupture Characteristics of Aluminum-Magnesium Solid Solution Alloys—N. J. Grant, Massachusetts Institute of Technology and A. W. Mullendore, Wright-Patterson Air Force Base.
Creep Behavior of Magnesium-Cerium Alloys—C. S. Roberts, Dow Chemical Co.
Creep Rupture Properties and Structural Changes in Carbon and Low Alloy Steels—A. B. Wilder, E. F. Ketterer and D. B. Collyer, National Tube Division, U. S. Steel Corp.

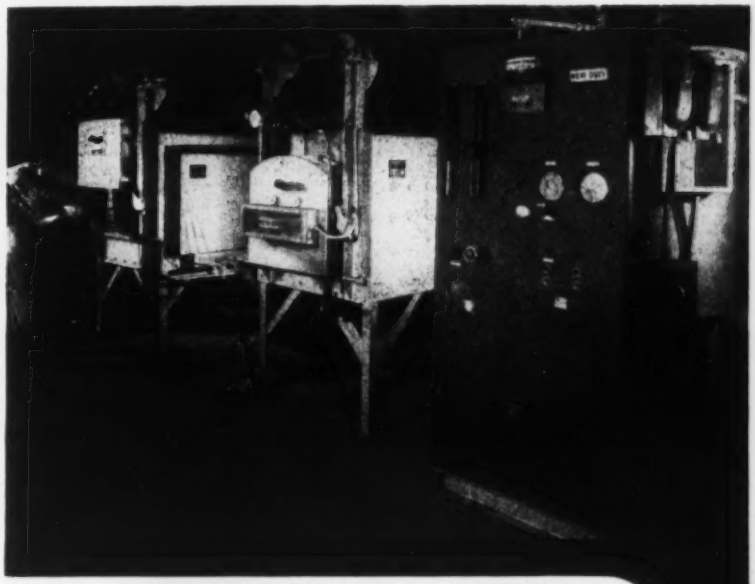
Wednesday, Nov. 3—2-5 p.m.

Ballroom

Titanium

H. D. Kessler and Harold Margolin, chairmen

Correlation Between Microstructure and Resistivity of Transforming Ti-Mn Alloys—D. J. Delazaro, Kropp Forge Co. and D. W. Levinson, Armour Research Foundation, Illinois Institute of Technology.
Effect of Alpha Solutes on the Heat Treatment Response of Ti-Mn Alloys—H. R. Ogden, F. C. Holden



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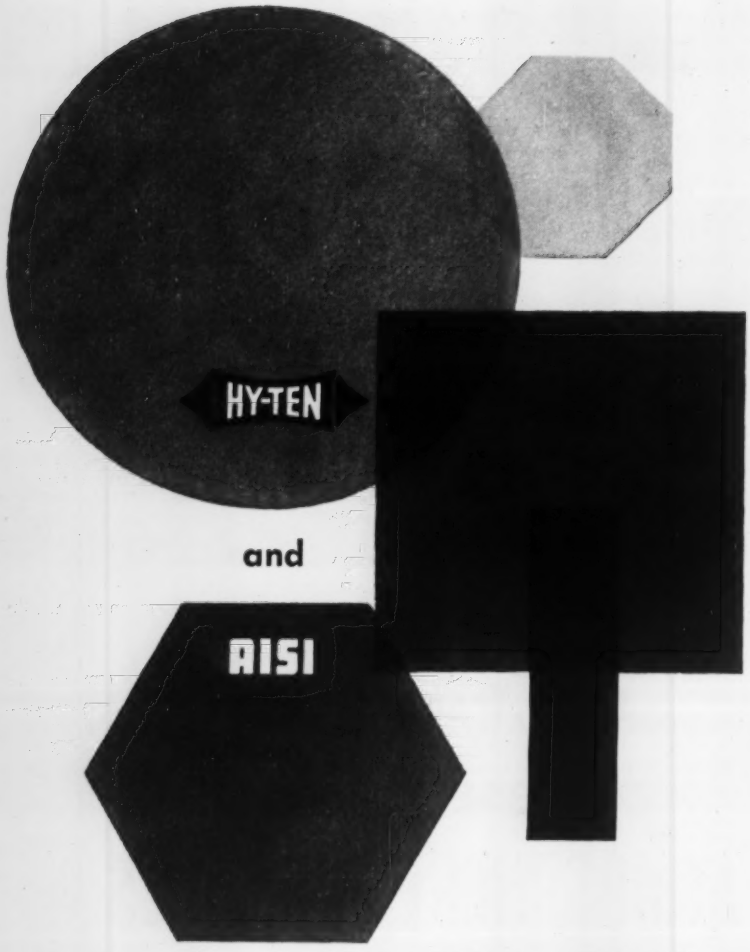

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AIME PROGRAM . . .

and R. I. Jaffee, Battelle Memorial Institute.

Mechanical Properties of Alpha Titanium as Affected by Structure and Composition—R. I. Jaffee, F. C. Holden and H. R. Ogden, Battelle Memorial Institute.

Heat Treatment and Mechanical Properties of Ti-Cu Alloys—F. C. Holden, A. A. Watts, H. R. Ogden and R. I. Jaffee, Battelle Memorial Institute.

Structure and Properties of Ti-C Alloys—H. R. Ogden, R. I. Jaffee and F. C. Holden, Battelle Memorial Institute.

The Titanium-Lead System — Paul Farrar and Harold Margolin, New York University.

Phase Transformations in Titanium-Rich Alloys of Iron and Titanium—J. G. Parr and D. H. Polonis, University of British Columbia.

Selected Isothermal Sections in the Titanium-Rich Corners of the Systems Ti-Fe-O, Ti-Cr-O and Ti-Ni-O—W. Rostoker, Armour Research Foundation of Illinois Institute of Technology.

Society for Nondestructive Testing

Gerold H. Tenney
President

All Meetings in Hotel Morrison

Monday, Nov. 1, 1954

General Chairman—W. C. Hitt, Douglas Aircraft Co., Inc.

Welcome—Dr. Gerold H. Tenney, Los Alamos Scientific Laboratories, President SNDT.

Educational Program

General Chairman—S. A. Wenk, Battelle Memorial Institute

9 a.m. Orientation Lecture—R. C. McMaster, Battelle Memorial Institute.

9:45 a.m. Sources of Defects Located by Nondestructive Testing—C. E. Betz, Magnaflux Corp.

10:30 a.m. Radiography—R. G. Tobey, Eastman Kodak Co.

11:15 a.m. Magnetic Particle Inspection—W. E. Thomas, Magnaflux Corp.

1:30 p.m. Penetrant Inspection—H. Migel, Magnaflux Corp.

2:15 p.m. Ultrasonics—J. C. Smack, Sperry Products Inc. and Peter Block, Branson Instrument Co.

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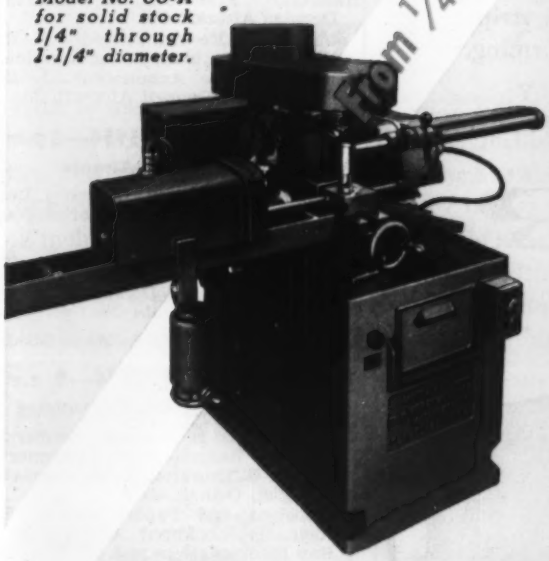

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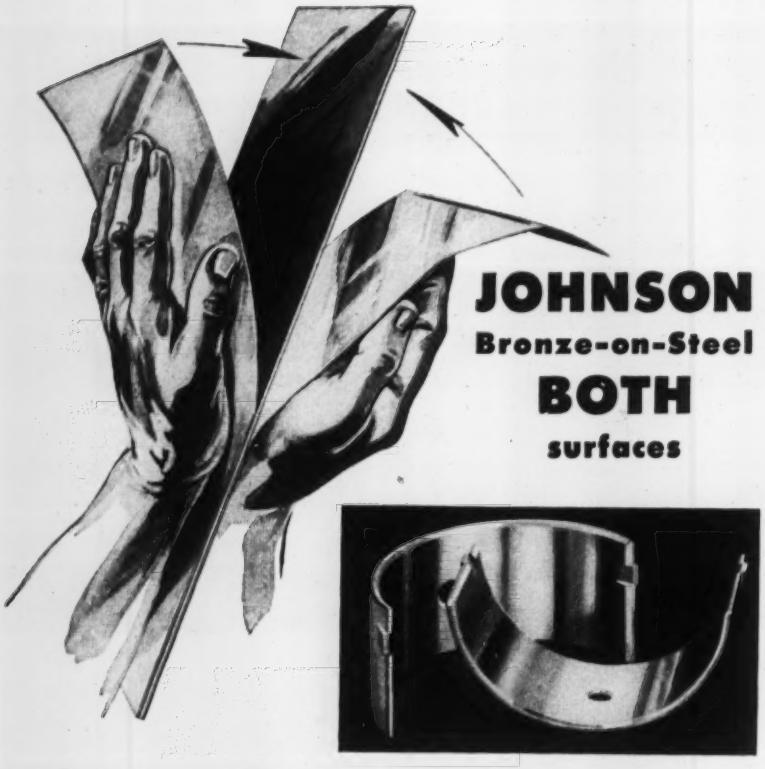

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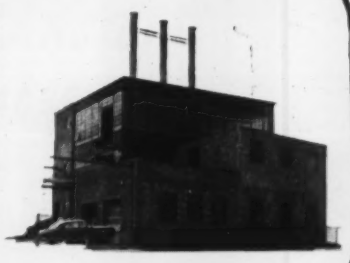
* To assure complete laboratory control of quality from the ingot to the finished product, Johnson Bronze has built a new powder plant for the production of alloy type powders by a patented process of disintegrating and quenching molten alloys. Therefore, the correct alloy for a particular use can always be prepared to correct specifications. This is another reason why Johnson Bronze has become known as Sleeve Bearing Headquarters.



SNDT PROGRAM . . .

3 p.m. Inter-Relation of Various Testing Methods—A. F. Cota, A. O. Smith Corp.
3:45 p.m. Evaluation of Indications of Discontinuities — J. H. Bly, X-Ray, Inc.
4:30 p.m. Question Period

Tuesday, Nov. 2, 1954—9 a.m.

Chairman: Norman C. Miller, Los Alamos Scientific Laboratories.
Co-chairman: Robert E. Reynolds, Lockheed Aircraft Co.
High - Sensitivity Fluoroscopy — Charles A. Mitchell, Mitchell Radiation Corp.
(Subject To Be Announced)—Stanley Stacey, Foster Wheeler Corp.

Tuesday, Nov. 2, 1954—2 p.m.

International speakers covering various phases of nondestructive testing as used abroad, and applications of eddy current testing.
Chairman: W. E. Havercroft, Department of Mines & Technical Surveys, Canada.
Co-chairman: R. G. Coleman, Chairman Ontario Section SNT, Ontario, Canada.
Preparation and Handling of Intense Radioactive Sources, Dr. Peter J. Stewart, Isotope Products Ltd., Ontario, Canada.
New Techniques in Electro-Magnetic Nondestructive Testing Methods—Dr. Friedrick Foerster, Institut Dr. Foerster, Kurrenstrasse 14, Reutlinger, (Western Zone) Germany.
(Subject To Be Announced)—Dr. R. Seifert, Hamburg, Germany.

Wednesday, Nov. 3, 1954—9 a.m.

Ultrasonics

Chairman—E. M. Marcus, Fairchild Aviation Corp.
Co-chairman—D. E. O'Halloran, Northrop Aircraft Corp.
Monitors—Steve Sickle, Magnaflux Corp., and Charles Widstrand, Ford Motor Co.
Reference Standards—Al Barath, Douglas Aircraft Co.
(Subject To Be Announced)—J. B. Morgan, Aluminum Co. of America.
(Subject To Be Announced)—J. E. Rutledge, McDonnell Aircraft Co.

Wednesday, Nov. 3, 1954—2 p.m.

Presentation of Awards

Chairman—Dr. Gerold H. Tenney, Los Alamos Scientific Laboratories, National President.
Mehl Honor Lecturer—Dr. E. E. Charlton, General Electric Co.
de Forest Award—Donald C. Erdman, Electro-Circuits Co.
Coolidge Award—(To Be Announced)

Thursday, Nov. 4, 1954—9 a.m.

Airline, Railway, Oil, Shipbuilding

Chairman—A. S. Pedrick, Southern Pacific Railroad; Co-Chairman: George G. Thurston, consulting metallurgist, Orinda, Calif.
Discussions and Papers—Robert E. Reynolds, Lockheed Aircraft Co.; Ray McBrian, Denver & Rio Grande Railroad; A. W. Gilbert, Carbide & Chemical Co.; A. V. Hutton, Newport News Shipbuilding & Dry Dock Co.

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ABC Die Casting Machine Co. Chicago	2030
A. I. T. Diamond Tool Co. Chicago	1658
Ace Drill Bushing Co. Inc. Los Angeles	2255
Acetogen Gas Co. Detroit	2147
Acme Mfg. Co. Detroit	1640
Acme Steel Co. Chicago	2129
Acme Tool Co. New York	1005
Action Diamond Tool Co. Chicago	1135
Adamas Carbide Corp. Kenilworth, N. J.	1411
Air Reduction Sales Co. New York	341
Ajax Electric Co. Inc.	
Ajax Electrothermic Corp.	
Ajax Engineering Corp. Philadelphia	752
Adjusto Equipment Co. Toledo, O.	1057
Aldridge Industrial Oils Inc. Cleveland	1424
Al-Fin Division, Fairchild Engine & Airplane Corp. Farmingdale, N. Y.	2070
Allegheny Ludlum Steel Corp. Brackenridge, Pa.	336
Allis-Chalmers Mfg. Co. Milwaukee	242
Allison Co. Bridgeport, Conn.	142
Alloy Engineering & Casting Co. Champaign, Ill.	1101
Alloy Metal Wire Co. Division of H. K. Porter Co. Inc. Prospect Park, Pa.	1645

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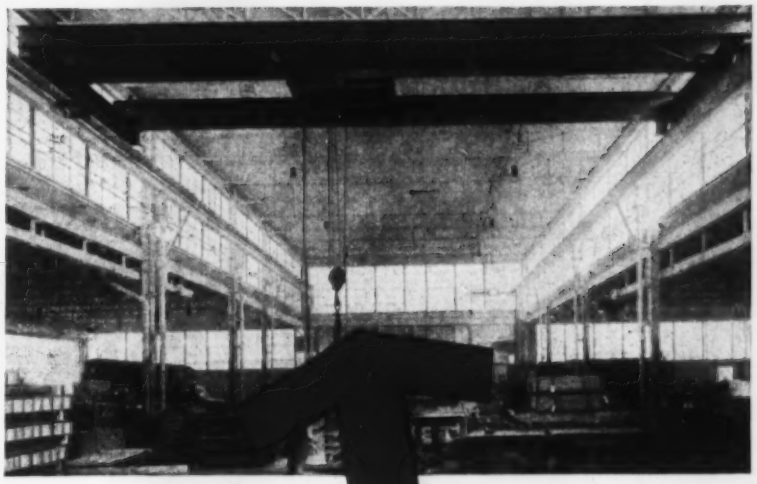
METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Alpha Metals Inc. Jersey City, N. J.	2344
American Brake Shoe Co. New York	762
American Cast Iron Pipe Co. Birmingham, Ala.	1020
American Chain & Cable Co. Bridgeport, Conn.	1228
American Chemical Paint Co. Ambler, Pa.	1036
American Cyanamid Co. New York	132
American Cystoscope Makers Inc. New York	2323
American Gas Association New York	843-854
American Gas Furnace Co. Elizabeth, N. J.	843-H
American Manganese Steel Division American Brake Shoe Co. New York	762
American Marietta Co. Cleveland	1618
American Metal Market New York	1549
American Nickeloid Co. Peru, Ill.	2314
American Optical Co. Buffalo	2229
American Pullmax Co. Inc. Chicago	1253
American Society for Metals Cleveland	603
American Wheelabrator & Equip. Corp. Mishawaka, Ind.	632
Amplex Division, Chrysler Corp. Detroit	1335
Applied Research Laboratories Glendale, Cal.	1342
Arcair Co. Lancaster, O.	1445
Aronson Machine Co. Arcade, N. Y.	2354
Arwood Precision Casting Corp. Brooklyn, N. Y.	1254
Ashworth Bros. Inc., Metals Division Worcester, Mass.	1723
Atlas Press Co. Kalamazoo, Mich.	2057
Atomic Energy of Canada Ltd. Ottawa, Ont., Can.	2040
Automotive Industries Magazine Philadelphia	2155
Avon Tube Division, Higbie Mfg. Co. Rochester, Mich.	1939
Babcock & Wilcox Co. New York	236
Baird Associates Inc. Cambridge, Mass.	1348
Baker & Co. Inc. Newark, N. Y.	1327



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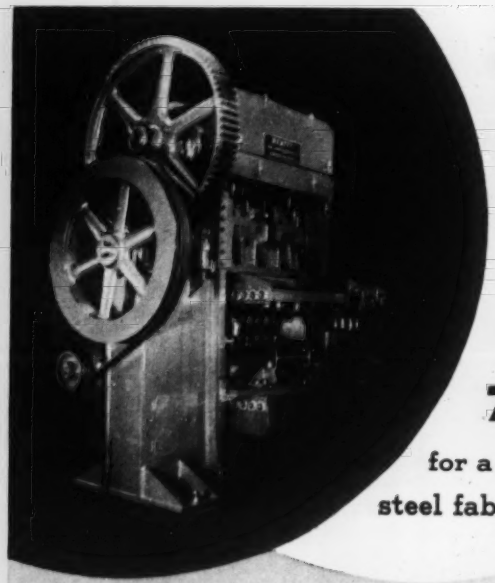
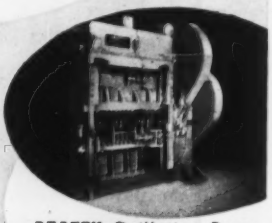


This Beatty Punch CUT COSTS 75%

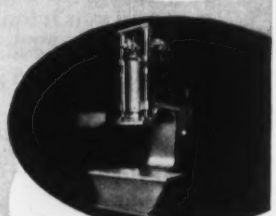
for a structural steel fabricator

One of our present-day satisfied customers formerly employed machinery using only one punch for punching structural steel shapes. After consulting a BEATTY engineer, this firm installed a BEATTY Guillotine Beam Punch with an adjustable tooling feature that enables them to perform exact repeats of multiple punch patterns in 25% of the time formerly required. Naturally, we can't guarantee such substantial savings in every industrial installation of BEATTY machines! But, if you're currently considering additional production machinery for your metal fabricating plant, better see a BEATTY engineer before making any final decisions! Chances are he'll have an idea or two on how you can achieve greater production economies with BEATTY Machines!



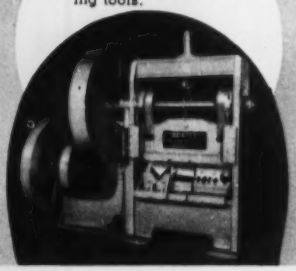
BEATTY Guillotine Beam Punches are available for punching webs and flanges in "I" beams from 6" to 30".

BEATTY Spacing Table handles web and flange punching without roll adjustment.



BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.

BEATTY
Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.



BEATTY
Machine & Mfg. Company
HAMMOND, INDIANA

METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Bakelite Division Union Carbide & Carbon Corp. New York	653
Baldwin-Lima-Hamilton Corp. Philadelphia	1065
Balteau Electric Corp. Stamford, Conn.	2246
Banner Mfg. Co. Milwaukee	1019
Baron Industries Los Angeles	2364
Bausch & Lomb Optical Co. Rochester, N. Y.	1242
Morris Bean & Co. Yellow Springs, O.	2118
Bell & Gossett Co. Morton Grove, Ill.	441
Beryllium Corp. Reading, Pa.	1717
Binks Mfg. Co. Chicago	420
Black Drill Co. Cleveland	1511
G. S. Blakeslee & Co. Chicago	1016
Boice-Crane Co. Toledo, O.	1729
Brainard Steel Division Sharon Steel Corp. Warren, O.	1758
Brake Shoe & Casting Division American Brake Shoe Co. New York	762
Branson Instruments Inc. Stamford, Conn.	2244
Bridgeport Brass Co. Bridgeport, Conn.	1015
Bristol Co. Waterbury, Conn.	1441
Charles Bruning Co. Inc. Chicago	1128
Brush Beryllium Co. Cleveland	2348
Brush Electronics Co. Cleveland	2317
Brush Laboratories Co. Cleveland	2317
Buck Tool Co. Kalamazoo, Mich.	460
Buehler Ltd. Chicago	1239
Cambridge Wire Cloth Co. Cambridge, Md.	1646
Cam-lok Division Empire Products Inc. Cincinnati	1056
Campbell Machine Division American Chain & Cable Co. New York	1228
Carbide & Carbon Chem. Co., Division of Union Car. & Car. Corp. New York	653

How *Burgess-Norton...* redesign and production facilities cut costs and improve performance on **Stephens-Adamson* conveyor pins

* Stephens-Adamson Mfg. Company, of Aurora, Illinois, one of the world's largest producers of conveyors, has installations in every part of the country . . . moving chemicals food products, coal, ore, hundreds of different materials. Many of these conveyors are operating 24 hours a day, and keeping these conveyors running without down-time is vitally important to the profit picture of these many industries.

The link pins used in their horizontal, side-pull, Redler conveyors had presented a problem of wear, breakage, and resulting conveyor down-time on some installations. For a solution, Stephens-Adamson called on the engineering and manufacturing know-how of Burgess-Norton. Here are the results:

ORIGINAL PIN DESIGN

wear and breakage on some installations

The pin was formerly a cold-headed design with a separate slip-over collar as a wear plate. The pin was not hardened and bearing areas varied in tolerance because pins were not ground after heading. Counter sink for cold-headed pin required extra machining time.

BURGESS-NORTON REDESIGN

better performance cost reduced 15%

The pin is now made from two screw machined parts, copper-hydrogen brazed into a single unit. Heat treated after brazing for longer wear, ground for closer tolerances. Costs reduced 10% to 15% in the various sizes despite extra operations for improved performance.

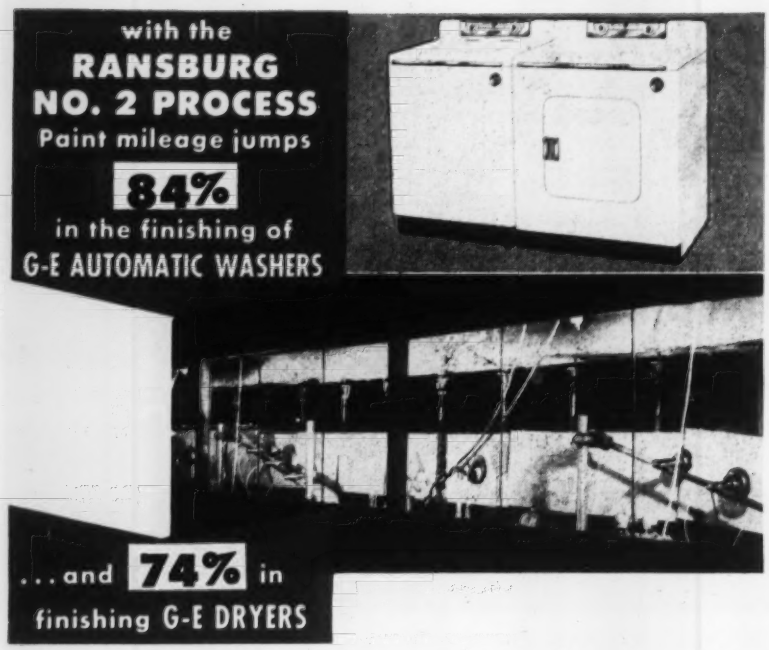
COMPLETE FACILITIES FROM DESIGN THROUGH PRODUCTION FOR BETTER PARTS AT LOWER COSTS

Burgess-Norton manufacturing facilities and equipment are extremely diversified for the economical production of a wide range of precision parts, and include complete engineering, development, and metallurgy departments. This engineering service is available to you without obligation. Send prints, specifications, or samples . . . or, if you prefer, one of our sales engineers will call at your convenience.

BURGESS-NORTON MFG. CO.

GENEVA, ILLINOIS

SERVING INDUSTRY FOR OVER FIFTY YEARS



Production is increased and quality of the work is improved over former hand spray method

● When General Electric formerly hand sprayed their home laundry equipment—automatic washers and dryers—they painted 9.74 washers with a gallon of paint. Now, in the new and modern plant at Appliance Park, Louisville—where they're using the Ransburg No. 2 Process—they get 17.97 units per gallon of paint. An increase of 84%!

And, where they formerly got 5.49 dryers per mixed gallon of finish, now—with the Ransburg No. 2 Electrostatic Spray Process—they get 9.56 dryers per gallon of paint. An increase of 74%!

Along with increased production, G.E. is getting a more uniform, higher quality finish. Another typical, on-the-job-example of the unmatched efficiencies of the Ransburg No. 2 Process of electrostatic spray painting!

Want to know what Ransburg Electrostatic Processes can do for you in your finishing department? Ask about the complete facilities for test-painting YOUR products—under simulated production conditions—in Ransburg laboratories.

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana
RANSBURG

METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Carboloy Department General Electric Co. Detroit	1540
Casting Engineers Inc. Chicago	1746
Centri-Spray Corp. Plymouth, Mich.	1745
Challenge Machinery Co. Grand Haven, Mich.	2130
Chase Brass & Copper Co. Waterbury, Conn.	302
Chicago Rivet & Machine Co. Bellwood, Ill.	1623
Chicago Screw Co. Bellwood, Ill.	2223
Chilton Co. New York	1159 & 2155
Cincinnati Sub Zero Products Co. Cincinnati	1630
Circo Equipment Co. Rahway (Clark Township), N. J.	225
Cities Service Oil Co. New York	1216
Clementina Ltd. San Francisco	1002
Clevite Corp. Cleveland	2317
Climax Molybdenum Co. New York	148
Cold Metal Products Co. Youngstown	141
Commander Mfg. Co. Chicago	1309
Commercial Filters Corp. Melrose, Mass.	1530
Consolidated Industries Inc. W. Cheshire, Conn.	1524
Consolidated Vacuum Corp. Rochester, N. Y.	2156
Continental Industrial Engineers Inc. Chicago	843-G
Cooley Electric Mfg. Corp. Indianapolis	1649
Crane Packing Co. Chicago	136
Dake Engine Co. Grand Haven, Mich.	1749
Dean Products Inc. Brooklyn, N. Y.	1401
Delaware Tool Steel Corp. Wilmington, Del.	2322
Delta Power Tool Division Pittsburgh	1053
Machinery Division, A. P. DeSanno & Son Inc. Phoenixville, Pa.	2139
Detrex Corp. Detroit	1365
Detroit Testing Machine Co. Detroit	1148
Diamond Machine Tool Co. Los Angeles	1260

From coast-to-coast, A. P. GREEN warehouse stocks are available for immediate delivery to your plant . . .

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You Lower Your Inventory Costs . . . You have on hand only the refractories you need . . . immediately.

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You Increase Production Space . . . By freeing storage space for more profitable use.

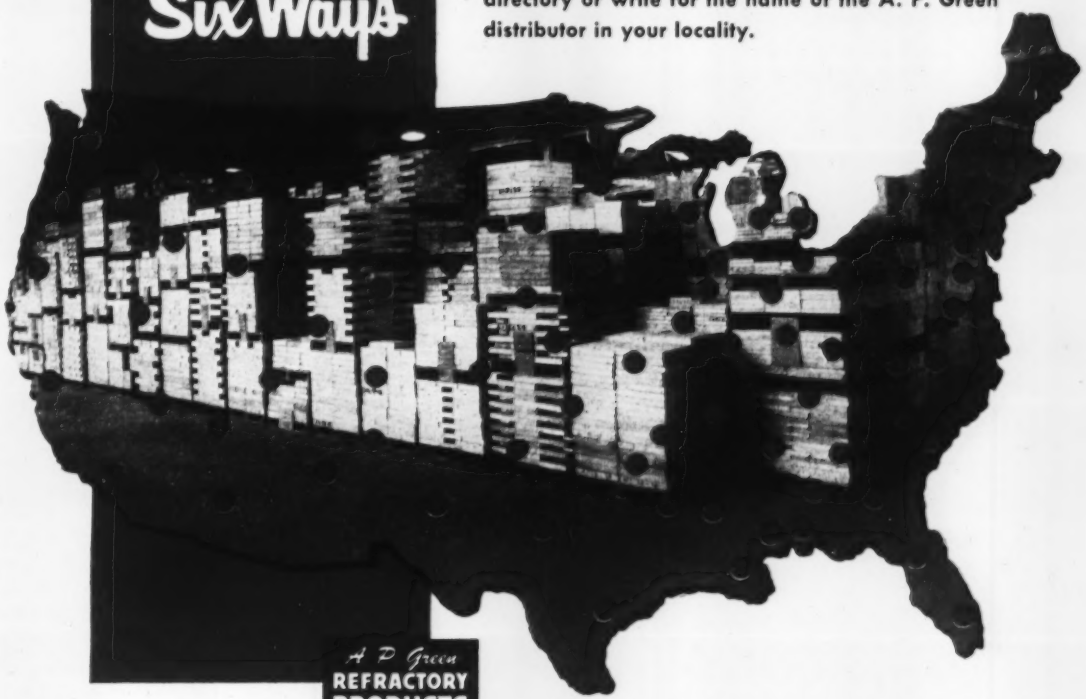
You Lower Labor Costs . . . A. P. Green refractories are delivered to the point of usage. There's no inplant moving by your workers.

You Maintain Steady Production . . . With less down time. A. P. Green warehouse stocks are complete and are available for immediate delivery.

Look in the classified section of your telephone directory or write for the name of the A. P. Green distributor in your locality.

THERE'S AN A. P. GREEN WAREHOUSE STOCK NEARBY

. . . to Save You Money Six Ways



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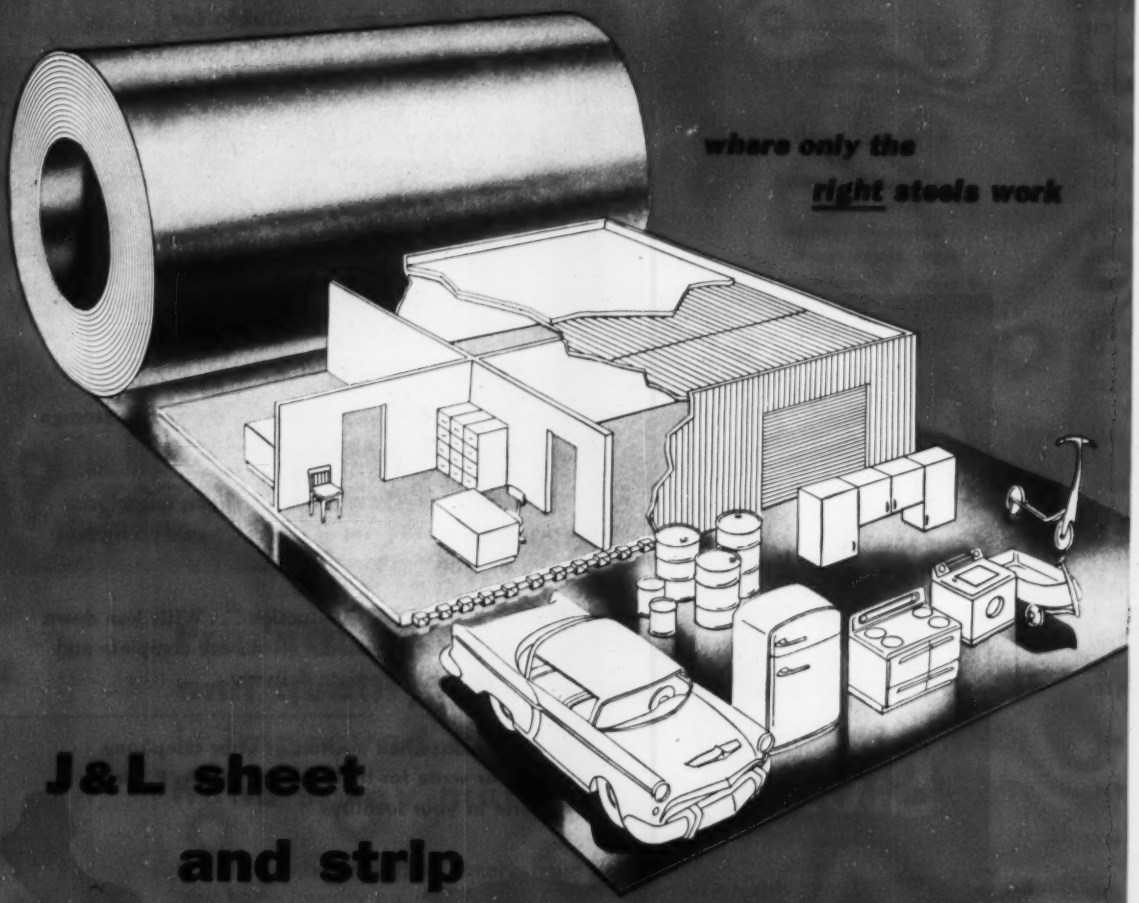

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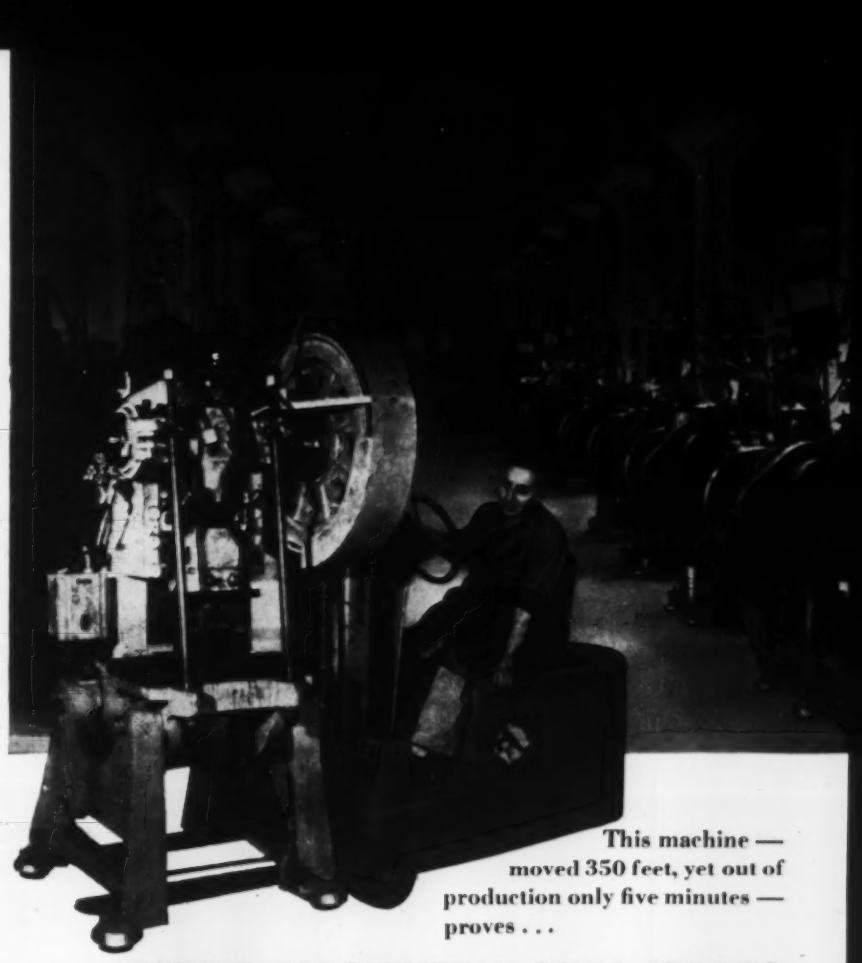
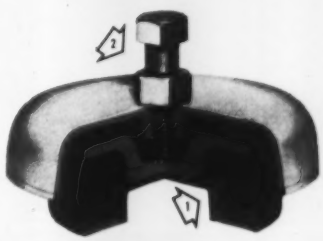
METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Diamond Power Specialty Corp. Lancaster, O.	2140
Dings Magnetic Separator Co. Milwaukee	1316
Diversey Corp. Chicago	1718
Doehler-Jarvis Corp., Division of National Lead Co. Toledo, O.	260
Dow Chemical Co. Midland, Mich.	620
Dow Furnace Co. Detroit	1041
Dreis & Krump Mfg. Co. Chicago	458
Wilbur B. Driver Co. Newark, N. J.	2029
Driver-Harris Co. Harrison, N. J.	2267
Dunmore Co. Racine, Wis.	1407
E. I. du Pont de Nemours & Co. Inc. Wilmington, Del.	2050
E. Shore Machine Products Co. Cleveland	1448
Eclipse Fuel Engineering Co. Rockford, Ill.	854-D
Elastic Stop Nut Corp. of America Union, N. J.	2023
Electric Arc Inc. Newark, N. J.	2102
Electric Furnace Co. Salem, O.	636
Electro-Alloys Division American Brake Shoe Co. New York	762
Electro Arc Mfg. Co. Ann Arbor, Mich.	1465
Electro Circuits Inc. Pasadena, Calif.	2136
Electro Metallurgical Co., Division of Union Carbide & Carbon Corp. New York	653
Elox Corp. of Michigan Detroit	1612
Empire Products Inc. Cincinnati	1056
Enamelstrip Corp. Allentown, Pa.	346
Engineered Casting Division American Brake Shoe Co. New York	762
Engis Equipment Co. Chicago	1629
Erico Products Inc. Cleveland	1429
Exomet Inc. Conneaut, O.	1539
Expert Die & Tool Co. Detroit	1330



This machine — moved 350 feet, yet out of production only five minutes — proves . . .

MOBILE MACHINERY CUTS COSTS



Leveling Barrymounts let you install machines anywhere, without fastening them to the floor. This means you gain machine mobility. Your product costs can be cut because mobile machinery gives you flexible production layouts. Machine maintenance and reject costs are cut because damaging external shocks are isolated. Installation costs are cut because requirements for expensive foundations are eliminated — no lag bolts to set or shims to drive, yet machines will not walk.

1 No lagging or cementing because the resilient mount isolates vibration and shock in all directions — machines won't walk.

2 Leveling is simple and fast — just turn the cap screw and tighten the lock nut — no shimming is necessary.

Write today for your free copy of LOOK — NO LAGGING and learn how you can save money with Barrymounts.

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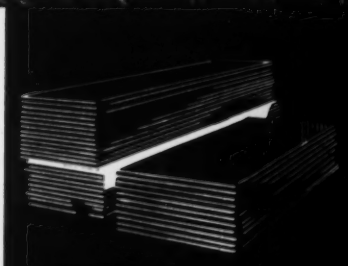
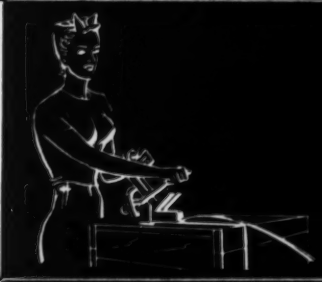
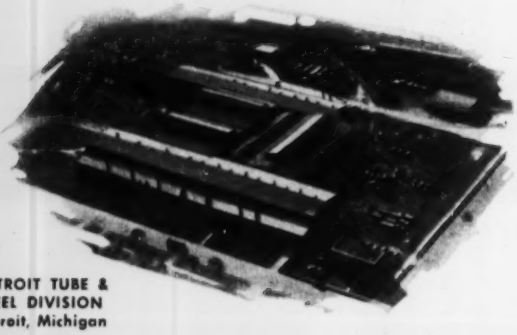
Sheet Steel — Hot Rolled, Pickled, Annealed, Deoxidized, Galvanized, Galvanite, Long Terne and Electrical Grades



BRAINARD STEEL DIVISION
Warren, Ohio

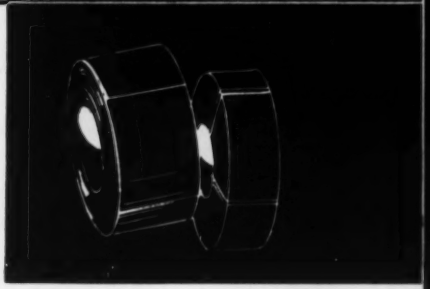
Tensional Steel Strapping, Heavy Duty Strapping, Strapping Tools and Accessories, Electric Welded Steel Tubing, Tel-O-Posts, Steel Strong Posts, Brite-Lite and Standard Areawalls, Roll-Formed Steel Lintels, Anti-Checking Irons, Brainard Scaffolding.





DETROIT TUBE & STEEL DIVISION
Detroit, Michigan

Cold Rolled Strip Steel

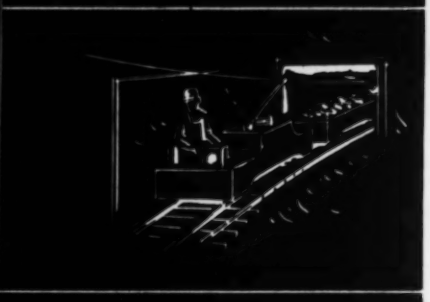


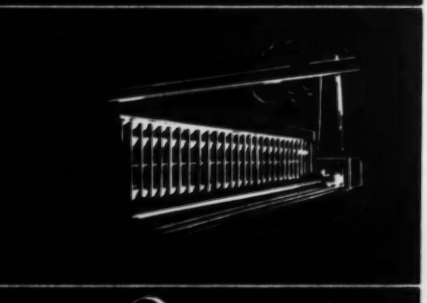
SHARON STEEL CORPORATION

Sharon, Pennsylvania

SHARONSTEEL

STEEL





SHARONSTEEL PRODUCTS DIVISION
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Sales Offices **Chicago, Cincinnati, Cleveland, Dayton, Detroit, Indianapolis, Los Angeles, Milwaukee, New York, Philadelphia, Rochester, San Francisco, Seattle, Montreal, Que., Toronto, Ont.**

METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Expert Welding Machine Co. Detroit	1330
Fansteel Metallurgical Corp. Chicago	1559
Federal Fawick Corp. Cleveland	1567
R. Y. Ferner Co. Inc. Malden, Mass.	1247
Ferrotherm Co. Cleveland	2247
Firth Sterling Inc. Pittsburgh	315
Flexonics Corp. Maywood, Ill.	1555
Gaertner Scientific Corp. Chicago	2334
Gas Appliance Service Inc. Chicago	854-A
Gas Machinery Co. Cleveland	854-C
General Alloys Co. Boston	652
General Blower Co. Morton Grove, Ill.	1545
General Controls Co. Glendale, Calif.	843-J
General Electric Co. Apparatus Sales Division New York	1060
General Electric Co. Milwaukee	1042
Gleason Works Rochester, N. Y.	454
Glo-Quartz Electric Heater Co. Inc. Willoughby, O.	1459
Auto. & Avia. Division B. F. Goodrich Co. Akron, O.	1650
Graham Machine Tool Co. New York	1025
Gray Co. Inc. Minneapolis	2145
Green Instrument Co. Inc. Cambridge, Mass.	1925
Gregory Industries Inc. Nelson Stud Welding Division Lorain, O.	215
Gries Industries Inc. Testing Machines Division New Rochelle, N. Y.	702
Gulf Oil Corp. Pittsburgh	1560
H & H Research Co. Detroit	1005
H & H Tube & Mfg. Co. Detroit	1502
HPL Mfg. Co. Cleveland	1418
Hammond Machinery Builders Inc. Kalamazoo, Michigan	1142
Handy & Harman New York	342
Harnischfeger Corp. Milwaukee	120
Harper Electric Furnace Corp. Buffalo	1919
Hauck Mfg. Co. Brooklyn, N. Y.	2124
Haveg Corp. Wilmington, Del.	1725
Haynes Stellite Co., Division of Union Carbide & Carbon Corp. Kokomo, Ind.	653
Heath Engineering Co. Fort Collins, Colo.	2340
Heil Process Equip. Corp. Cleveland	2038
Heli-Coil Corp. Danbury, Conn.	1655
Heller Machine Co. New York	1116
Heston & Anderson Co. Fairfield, Iowa	310
Hevi-Duty Electric Co. Milwaukee	247
Hills-McCanna Co. Foundry Division Chicago	2301
R. C. Hitchcock & Sons Inc. Minneapolis	2017

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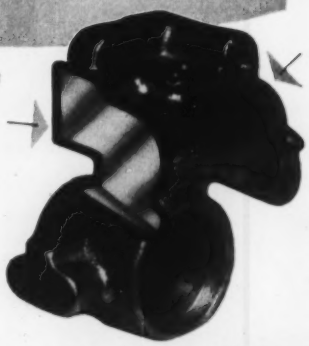
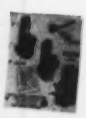
Speeds production of parking brake brackets designed and built the ***American*** *way*

Two parallel surfaces on each of two parts are straddle broached in one pass on this American SB-42-10 single ram broaching machine. Over 350 of these intricate parking brake brackets are completed every hour.

For the answer to your broaching problem send a part-print or sample and hourly requirements to American. No obligation. Address Dept. B.



For more information on the American SB-42-10 and other American machines, write for Circular #300.



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A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN
See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

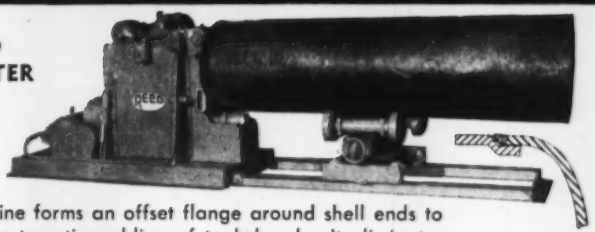
SUNDSTRAND

METAL SHOW EXHIBITORS

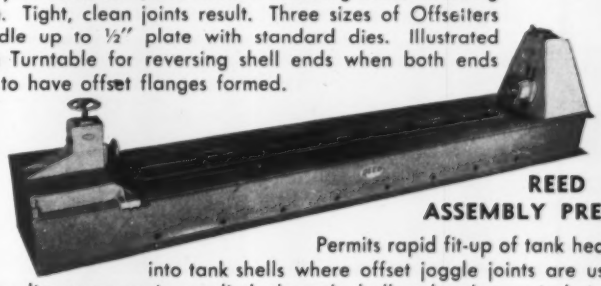
EXHIBITORS	BOOTH NO.
Hitchiner Mfg. Co. Inc. W. Hartford, Conn.	1412
Hobart Bros. Co. Troy, O.	365
Holcroft & Co. Detroit	1220
Holger Andreasen Inc. San Francisco	2259
Charles A. Hones Inc. Baldwin, L. I., N. Y.	854-E
E. F. Houghton & Co. Philadelphia	1010
Howard Foundry Co. Chicago	1227
Hydraulic Press Mfg. Co. Mt. Gilead, O.	109
Illinois Testing Laboratories Chicago	1154
Induction Heating Corp. Brooklyn, N. Y.	2239
Industrial Press New York	2018
Industrial Publishing Co. Cleveland	1055
Industrial Tectonics Inc. Ann Arbor, Mich.	2249
Industrial X-Ray Inc. W. Hempstead, N. Y.	2211
Instron Engineering Corp. Quincy, Mass.	2339
Insulation & Wires Inc. St. Louis	2355
International Nickel Co. Inc. New York	745
Ipsen Industries Inc. Rockford, Ill.	819
Iron Age New York	1159
Janney Cylinder Co. Philadelphia	1767
Jarke Mfg. Co. Chicago	101
Jarrell-Ash Co. Newtonville, Mass.	1147
Jet Combustion Inc. Chicago	1550
S. C. Johnson & Son Inc. Racine, Wis.	1326
C. Walker Jones Co. Philadelphia	2149
K S M Products Inc. Merchantville, N. J.	1115
C. M. Kemp Mfg. Co. Baltimore	9854B
Kennametal Inc. Latrobe, Pa.	326
Kennecott Copper Corp. New York	302
Kent Cliff Laboratories Division Torsion Balance Co. Clifton, N. J.	2343
L. R. Kerns Co. Chicago	1440
Kester Solder Co. Chicago	1548
Andrew King Ardmore, Pa.	1241
Knight Models Inc. Chicago	2150
Kolcast Industries Inc. Cleveland	1927
Kolene Corp. Detroit	1518
Korhumel Steel & Aluminum Co. Evanston, Ill.	1624
Kux Machine Co. Chicago	1001
Laboratory Equipment Co. St. Joseph, Mich.	2316
Leeds & Northrup Co. Philadelphia	442
E. Leitz Inc. New York	2224
Lempco Products Inc. Bedford, O.	1460
Lepel High Frequency Laboratories Inc. New York	1031
Lincoln Electric Co. Cleveland	646
Lindberg Engineering Co. Chicago	662

WEBB PLATE FABRICATING MACHINERY

REED OFFSETTER



This machine forms an offset flange around shell ends to facilitate automatic welding of tank heads. It eliminates chill rings, decreases fit-up time, improves the concentricity of shell ends, and aids in reducing actual welding time. Tight, clean joints result. Three sizes of Offsetters handle up to ½" plate with standard dies. Illustrated with Turntable for reversing shell ends when both ends are to have offset flanges formed.



REED ASSEMBLY PRESS

Permits rapid fit-up of tank heads into tank shells where offset joggle joints are used. Hydraulic pressure is applied through ball-and-socket swivel joints that allow the head cups to set to the head. Hydraulically powered kick-outs speed up loading and unloading. Both headstock and tailstock are adjustable vertically; tailstock is also adjustable along the bed for various lengths of vessels up to 18'.

Fit-up rolls are also available to facilitate proper alignment and assembly of shells lacking rigidity.

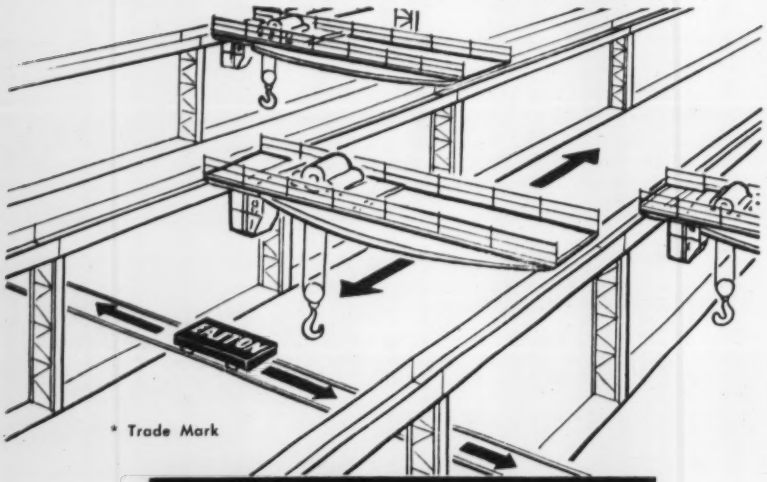
Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

WRITE FOR ADDITIONAL INFORMATION

REED EQUIPMENT DIVISION
THE WEBB CORP. WEBB CITY, MO. U. S. A.

Cross-Bay* Transfer

Automatic motor-driven transfer cars provide a universal handling system in modern parallel bay plants now served by overhead cranes. Also for transfer between plant buildings.

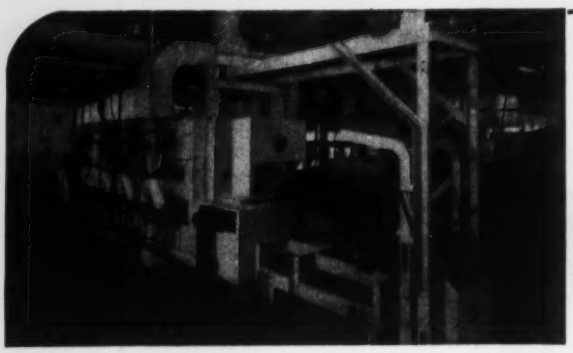


* Trade Mark

A-1041

® EASTON

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH



LOW COST HEAT TREATMENT
of small and medium size parts

● EF chain belt furnaces are the most satisfactory heat treating equipment yet devised for carbon restoration, scale free hardening and hardening without decarburization of small and medium size parts. Built in 11 standard sizes for capacities up to 2,000 lbs. per hour. Larger sizes to meet any requirement. Gas-fired, oil-fired or electrically heated, whichever best suits your particular requirement—and location. Estimates of equipment, installation and operating costs—and samples of treated parts—furnished promptly. Write for literature.

EF

GAS-FIRED OIL-FIRED and ELECTRIC **FURNACES** *for*

AGING
ANNEALING
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CARBON RESTORATION
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SPECIAL ATMOSPHERE TREATMENTS

A SIZE AND TYPE OF FURNACE FOR EVERY PROCESS PRODUCT OR PRODUCTION

THE ELECTRIC FURNACE CO.
GAS FIRED, OIL FIRED AND ELECTRIC FURNACES
Salem-Ohio

Canadian Associates ● CANEFCO LIMITED ● Toronto 1, Canada

METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Linde Air Products Co., Division of Carbide and Carbon Corp. New York	653
Livingston Tool Co. Algona, Iowa	310
Logan Engineering Co. Chicago	1617
Los Angeles Department of Water & Power Los Angeles	1712
Lufkin Rule Co. Saginaw, Mich.	2311
Lynchburg Foundry Co. Lynchburg, Va.	2067
M. B. I. Export & Import Ltd. New York	125
Magnaflux Corp. Chicago	1315
Magnethermic Corp. Youngstown	1660
Magnetic Analysis Corp. Long Island City, New York	2349
Malayan Tin Bureau Washington	1909
Mallory-Sharon Titanium Corp. Niles, O.	1537
Manhattan Rubber Division Passaic, N. J.	1201
Manufacturers Processing Co. Detroit, Mich.	1421
Marsh Stencil Machine Co. Belleville, Ill.	2015
Martindale Electric Co. Cleveland	1415
Master Builders Co. Cleveland	1618
Mead Specialties Co. Chicago	2011
Merrill Brothers Maspeth, N. Y.	1517
Metallizing Engineering Co. of America Chicago	1456
Metal Lubricants Co. Chicago	2056
Metal Removal Co. Chicago	235
Metal & Thermit Corp. New York	409
Metalloid Corp. Huntington, Ind.	2367
Metalwash Machinery Corp. Elizabeth, N. J.	1467
Met-L-Chek Co. Los Angeles	2326
Michiana Products Corp. Michigan City, Ind.	1759
Michigan Crane & Conveyor Co. Detroit	1943
Michigan Steel Casting Co. Detroit	1730
Micrometrical Mfg. Co. Ann Arbor, Mich.	2218

Production

is behind SANDVIK SPRING STEEL'S successful performance

Sandvik specialty steels are carefully produced in relatively small quantities which facilitate closer control and uniform results.

Pure Swedish ore and coniferous, sulphur-free fuel are used to produce pig iron of unusually high quality. Sandvik's small blast furnaces and steel furnaces afford closer control of the quality of each heat.

In the subsequent rolling and annealing operations, Sandvik applies its specialized experience, skill and equipment,— "tailoring" the steel to the precise gauge, hardness and surface finish required.

The final result is the inherent quality which has made Sandvik spring steel successful in so many exacting applications.

You can get Sandvik strip steels:

- **In special analyses for specific applications.**
- **Precision-rolled in thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered.**
- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**
- **Wide range of sizes in stock — also slitting facilities available.**

Ask your nearest Sandvik office for further information or technical assistance.

Sandvik Swedish Specialty Strip Steels are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compressor Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical, etc. • Razor Blades • Shock Absorbers • A Wide Variety of Springs • Trowels • Reeds: Vibrator, Textile, etc. • Piston Ring Segment and Expanders • and many other applications.

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SANDSTEEL SPRING DIVISION • New York • Industrial Springs
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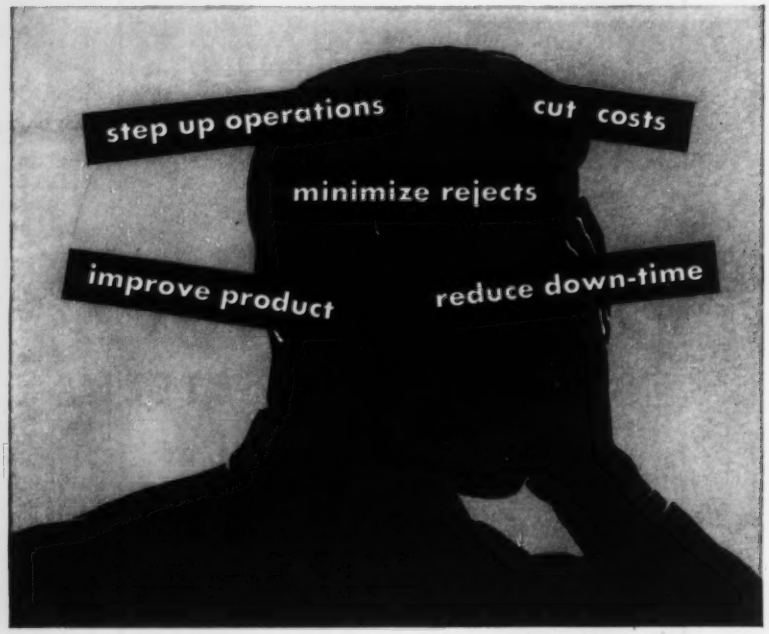
SS-104



take your "HEADACHES"

to a specialist . . .

WALLINGFORD STEEL

FOR QUALITY STAINLESS STRIP

We specialize in easing "headaches" brought on by the need for . . . an improved product . . . better production . . . reduced fabricating and finishing costs . . . fewer rejects . . . less down-time. We prescribe . . .

WALLINGFORD STAINLESS STRIP

- Thinnesses to .002".
- Accuracy to ± .0001".
- Meets *rigid* specifications for size, finish, analysis, temper.
- Has smooth, straight edges.
- Gages uniformly.
- Draws easily.
- Punches cleanly.
- Special sections rolled to your exact design.

Write today. We'll meet the challenge of your most persistent product, cost and production "headaches" with a staff of specialists — engineers, metallurgists and production experts — well-qualified to administer effective treatment.

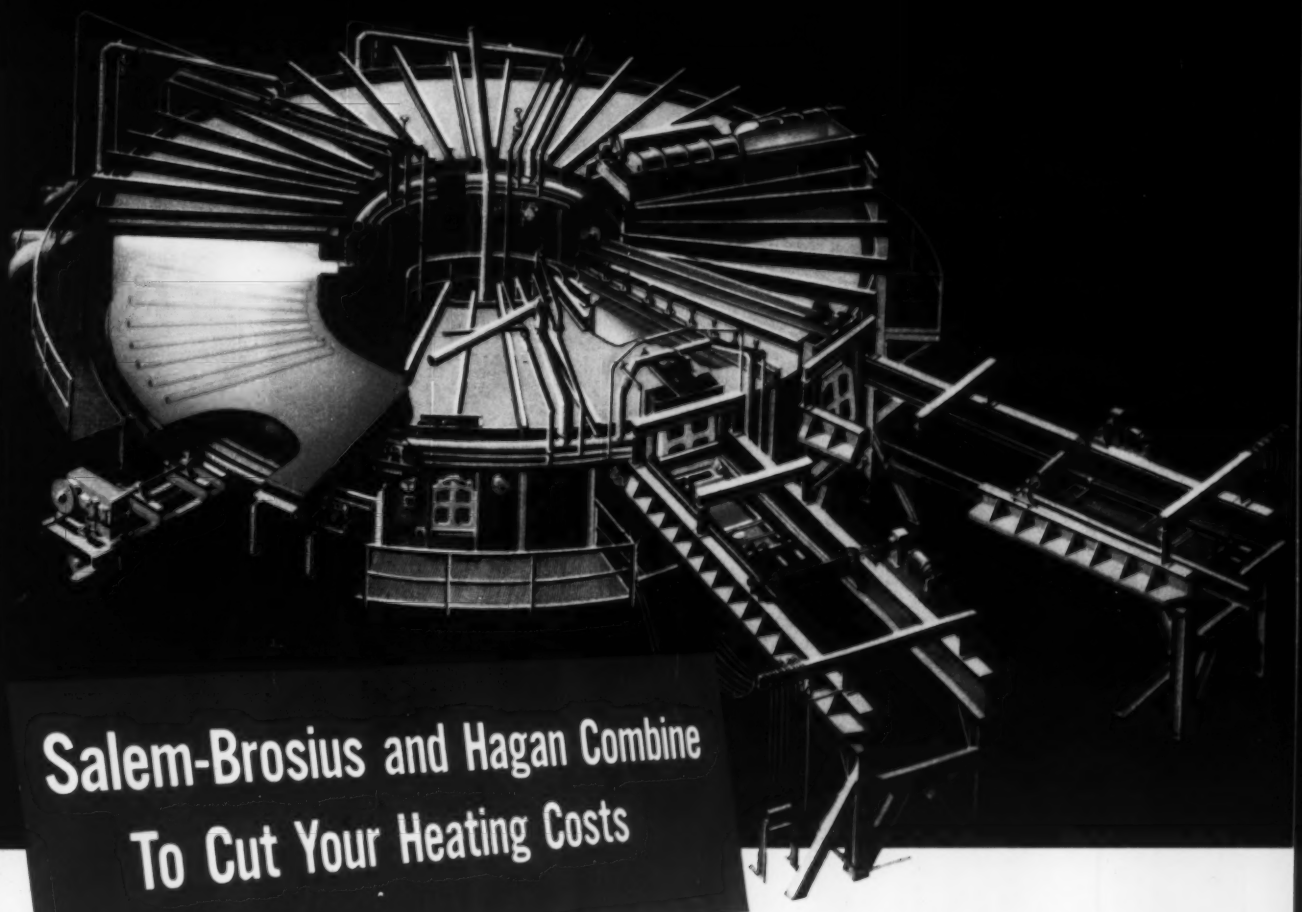
THE WALLINGFORD SINCE 1922 CO.

WALLINGFORD, CONN., U.S.A.

STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP • STAINLESS WELDED TUBES AND PIPE

METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Miller Electric Mfg. Co. Appleton, Wis.	248
A. Milne & Co. New York	216
Minneapolis-Honeywell Regulator Co. Philadelphia	1347
Misco Fabricators Inc. Detroit	1730
Mitchell Radiation Products Corp. Norristown, Pa.	2335
Motch & Merryweather Machinery Co. Cleveland	2160
National Bearing Division American Brake Shoe Co. New York	762
National Carbon Co. Division of Union Carbide & Carbon Corp. New York	653
National Cored Forgings Co. Inc. South Norwalk, Conn.	1236
National Diamond Laboratory New York	1931
National Industrial Publishing Co. Pittsburgh	1647
National Lead Co. New York	260
National Radiator Co. Plastics Metals Division Johnstown, Pa.	1911
National Research Corp. Newton Highlands, Mass.	1160
National Spectrographic Sales Corp. Cleveland	2230
National Torch Tip Co. Pittsburgh	2048
Nelson Stud Welding Division Lorain, O.	215
New Hermes Engraving Machine Corp. New York	1935
Nicholas Equipment Co. Bellevue, O.	2306
N. American Philips Co. Inc. Mt. Vernon, N. Y.	1740
Oakite Products Inc. New York	1601
Ohio Crankshaft Co. Cleveland	160
Ohio Seamless Tube Division Copperweld Steel Co. Shelby, O.	744
Ohio Steel Foundry Co. Springfield, O.	1435
Olin Industries Inc. E. Alton, Ill.	110
Tinius Olsen Testing Machine Co. Willow Grove, Pa.	1141
O'Neil-Irwin Mfg. Co. Lake City, Minn.	1215
Optical Film Engineering Co. Philadelphia	1457
Osborn Mfg. Co. Cleveland	1320



Salem-Brosius and Hagan Combine To Cut Your Heating Costs

When Salem-Brosius recently purchased the George J. Hagan Company, some of the finest furnace engineering brains in the world were consolidated into a single team to bring you the best in industrial heating at the lowest initial and operating costs.

Take, for example, the massive rotary hearth furnace illustrated here. Salem-Brosius' new combined engineering group has designed almost all of these furnaces—not only in the United States but all over the world. This type of furnace ranges from 5 to 90 feet in diameter, and can be used for a wide variety of metal and metal part heating and heat treating jobs.

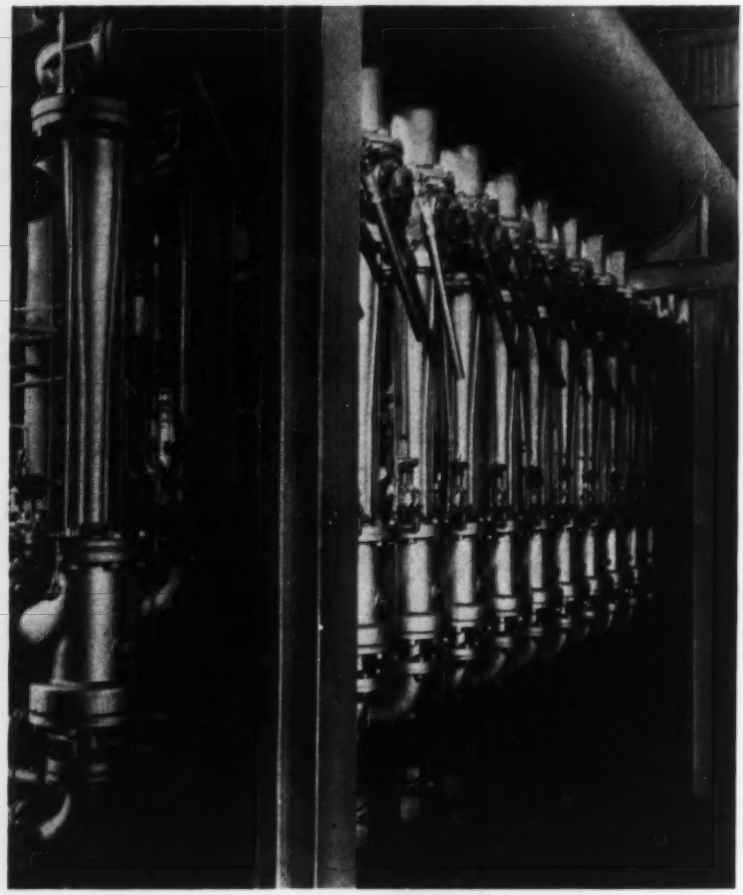
The circular shape saves valuable plant floor space. Fuel efficiency is unparalleled by any other type of furnace. Heating is rapid and uniform. Automaticity of control drastically cuts labor costs. And good design with good construction minimizes maintenance expenses. All of these benefits together spell higher furnace output at lower cost—and greater profit to you, the user.

If your plant modernization or expansion plans call for heating or heat treating furnaces of any kind, furnace charging machines, forging manipulators, hot materials handling equipment, large diameter gas main valves, or other special machinery or furnace equipment, write, wire, or phone Salem-Brosius!

SALEM-BROSIUS, INC.

EXECUTIVE OFFICES: 248 FOURTH AVENUE, PITTSBURGH 22, PA.

PIPE ORGAN FOR HOT TUNES



I-R Ejector Jets automatically maintain desired BTU content of gas mixture for firing metallurgical furnaces at Fairless Works.

The pipes in this "organ" produce no music. Yet the steady roar of gases which they control is music to the ears of the utility men at U. S. Steel's new Fairless Works. For this bank of fifteen I-R ejectors plays a major role in keeping the furnace fires burning at constant, high efficiency.

The reheating and pit furnaces at Fairless normally burn coke oven gas. At times, however, there isn't enough of it and natural gas must be introduced as fuel. If the natural gas were burned in its virgin state the burners would have to be readjusted every time, since coke oven gas has only half the BTU value of natural gas. That's where the jets come in. They mix just enough air with the natural gas to give it the same heat flow factor as coke oven gas. The natural gas is expanded through the nozzle of the jet, picking up air through the suction. Gas flow is regulated automatically according to load requirements by cutting any of the fifteen jets into or out of the system.

This is another example of how Ingersoll-Rand experience in the design and engineering of steam jet ejectors was able to solve a specific operating problem. The same time-saving, cost-saving service is available for *your* problems, too. Just call your nearest I-R representative or branch office.

Ingersoll-Rand

4-86 11 Broadway, New York 4, N. Y.

PUMPS • COMPRESSORS • GAS & DIESEL ENGINES • ROCK DRILLS • VACUUM EQUIPMENT • AIR & ELECTRIC TOOLS & HOISTS

METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Pangborn Corp. Hagerstown, Md.	426
Park Chemical Co. Detroit	406
Parker Appliance Co. Cleveland	310
Parker Rust Proof Co. Detroit	2039
Partlow Corp. New Hartford, N. Y.	465
Penton Publishing Co. Cleveland	175
Phillips Mfg. Co. Chicago	1319
Phoenix Products Co. Milwaukee	1449
National Radiator Co. Johnstown, Pa.	1911
Portage Double Quick Akron, O.	1535
H. K. Porter Co. Inc. Somerville, Mass.	1645
Porter-Cable Machine Co. Syracuse, N. Y.	1443
Porter-McLeod Machine Tool Co. Inc. Hatfield, Mass.	301
Powdered Metal Products Division Yale & Towne Mfg. Co. Franklin Park, Ill.	2260
Precision Castings Co. Inc. Syracuse, N. Y.	1430
Precision Extrusions Bensenville, Ill.	2217
Precision Metalsmiths Inc. Cleveland	2045
Precision Welder & Flexopress Corp. Cincinnati	265
Pressco Casting & Mfg. Corp. Chesterton, Ind.	2215
Production Machine Co. Greenfield, Mass.	210
Pyrofax Gas Co., Division of Union Carbide & Carbon Corp. New York	653
Pyrometer Instrument Co. Inc. Bergenfield, N. J.	1120
Ransburg Electro-Coating Corp. Indianapolis	235
N. Ransohoff Inc. Hamilton, O.	215
Raybestos-Manhattan Inc. Manhattan Rubber Division Passaic, N. J.	1201
Raytheon Mfg. Co. Waltham, Mass.	1739
Reeves Pulley Co. Columbus, Ind.	1750
Renite Co. Columbus, Ohio	2345
J. A. Richards Co. Kalamazoo, Mich.	1453
Riehle Testing Machines Division American Machine & Metals Inc. E. Moline, Ill.	1248
Rigidized Metals Corp. Buffalo	1425
Rockwell Mfg. Co. Delta Power Tool Division Pittsburgh	1053
Rodgers Hydraulic Inc. Minneapolis	419
Rolock Inc. Fairfield, Conn.	1724
Jos. T. Ryerson & Son Inc. Chicago	730
"S" Corrugated Quenched Gap Co. Scientific Electric Division Garfield, N. J.	147
Safety Clothing & Equipment Co. Cleveland	1547
Salem-Brosius Inc. Pittsburgh	241
Geo. Scherr Co. Inc. New York	1119
Geo. T. Schmidt Inc. Chicago	1362
Schnell Tool & Die Corp. Salem, O.	2241
A. Schrader's Son Brooklyn, N. Y.	1127

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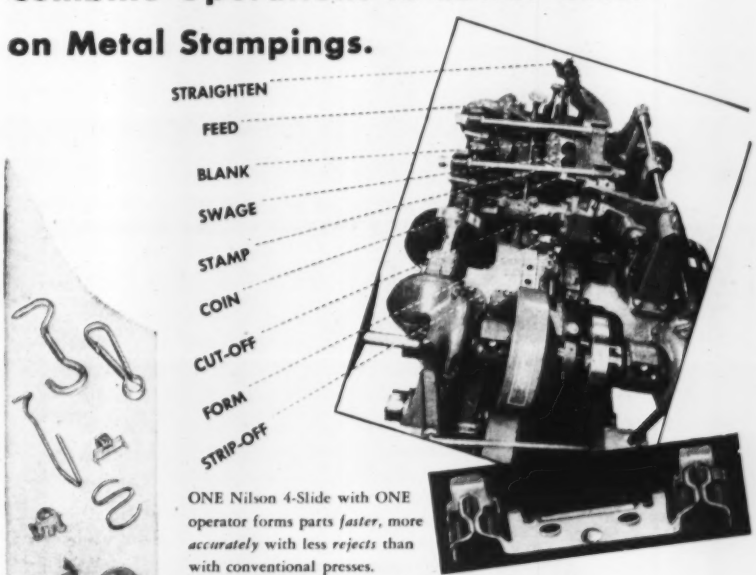
NILSON FOUR-SLIDES

Combine Operations to Lower Costs on Metal Stampings.



ONE Nilson 4-Slide with ONE operator forms parts *faster*, more *accurately* with less *rejects* than with conventional presses.

Elimination of secondary handling, lower tooling and set up costs *means added profits*. Wide range of models for wire and ribbon metals. Feed lengths to 32", stock widths to 3½" Press capacity to 75 tons.

For specific recommendations — send details of your operation.

THERE'S NILSON *NOTHING LIKE A*

Write, Wire, Phone for full particulars.

THE A. H. NILSON MACHINE COMPANY

1512 Railroad Avenue • Bridgeport 5, Connecticut

Automatic Chain-Making Machines • Automatic Staple Forming Machines • Wire and Strip Reels • Feed Presses • Wire Straightening Equipment • Slide Pads for Presses

SPECIAL INTRODUCTORY UNIT

WHISTLER

10 HOLE MAGNETIC PERFORATING DIE

Cut die costs drastically, start production quicker

This M-12-14 Complete Introductory Unit includes a set of blank templates, ten punches, dies, strippers and punch and die retainers complete to make up a ten hole precision perforating die. Any diameters from ⅛" to ½" to your selection. Catalog illustrates additional re-use economies.

$675 NET F. O. B. OUR PLANT

WHISTLER DIES ARE CUTTING COSTS FROM COAST TO COAST

SEND FOR CATALOG Illustration shows how quick and simple it is to set up a Whistler Magnetic Perforating Die ready for production. Larger standard units can be added to suit your requirements.

S. B. WHISTLER & SONS, INC.

Manufacturers of Adjustable, Magnetic and Custom Built Dies for All Industry

742 Military Road Buffalo 23, New York

DEMONSTRATIONS DAILY—BOOTH 135—METAL SHOW—NOV. 1 to 5

METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Sciaky Bros. Inc. Chicago	435
Scientific Electric Division Garfield, N. J.	147
C. U. Scott & Son Inc. Rock Island, Ill.	456
Scovill Mfg. Co. Waterbury, Conn.	430
Selas Corp. of America Philadelphia	854-F
Sentry Co. Foxboro, Mass.	445
Service Diamond Tool Co. Ferndale, Mich.	2336
Service Machine Co. Chicago 20, Ill.	1611
Sharon Steel Corp., Brainard Steel Division Warren, O.	1758
Sheldon Machine Co. Inc. Chicago	1059
Shell Oil Co. New York	2359
Shenango-Penn Mold Co. Dover, O.	2112
Sinclair Refining Co. Chicago	2049
Skil Corp. Chicago	2201
Smith Welding Equipment Corp. Minneapolis	2250
Socony-Vacuum Oil Co. Inc. New York	1546
Solventol Chemical Products Inc. Detroit	347
South Bend Lathe Works So. Bend, Ind.	2256
South Chester Corp. Southco Division Philadelphia	2324
Special Libraries Association Metals Division New York	802
Spencer Turbine Co. Hartford, Conn.	843-K
Sperry Products Inc. Danbury, Conn.	2212
Square D Co. Milwaukee	1437
Stanat Mfg. Co. Long Island City, N. Y.	1659
Standard Electrical Tool Co. Cincinnati	1028
Standard Oil Co. of Indiana Chicago	2036
L. S. Starrett Co. Athol, Mass.	2101
Steel Magazine Cleveland	165
Steel City Testing Machines Inc. Detroit	1151
Steel Sales Corp. Chicago	725

Reduce Steel Mill Fire Hazards...*

with HOUGHTO-SAFE HYDRAULIC FLUID

Hydraulic applications near heat such as dolomite chargers and coke oven door closers call for Houghto-Safe non-flammable hydraulic fluid.

Houghton Houghto-Safe is not "just another non-flammable fluid". It is a fluid developed expressly to meet *all* the demands of efficient operation of hydraulic equipment.

First, it will not burn! It is a "snuffer" type, water-base fluid that will put out fires—not start them!

Second, it incorporates the lubricating qualities and high film strength necessary to assure normal pump and equipment life.

Third, it will not affect standard packing materials. Whatever packings you are now using will function equally well with Houghto-Safe.

Fourth, it is non-toxic. There are no fumes given off by Houghto-Safe and it has no ill effect upon actual contact with the skin.

In fact, Houghto-Safe gives you *all* the operating benefits of standard hydraulic oils and—IT WON'T BURN!

Don't take chances with plant, equipment, personnel or production. Investigate Houghton Houghto-Safe for every hydraulic application operating near flame or high heat.

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PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

HYDRAULIC FLUIDS and PACKINGS, LUBRICANTS, COOLANTS and CUTTING OILS, RUST PREVENTIVES

ACCO Registered* Slings

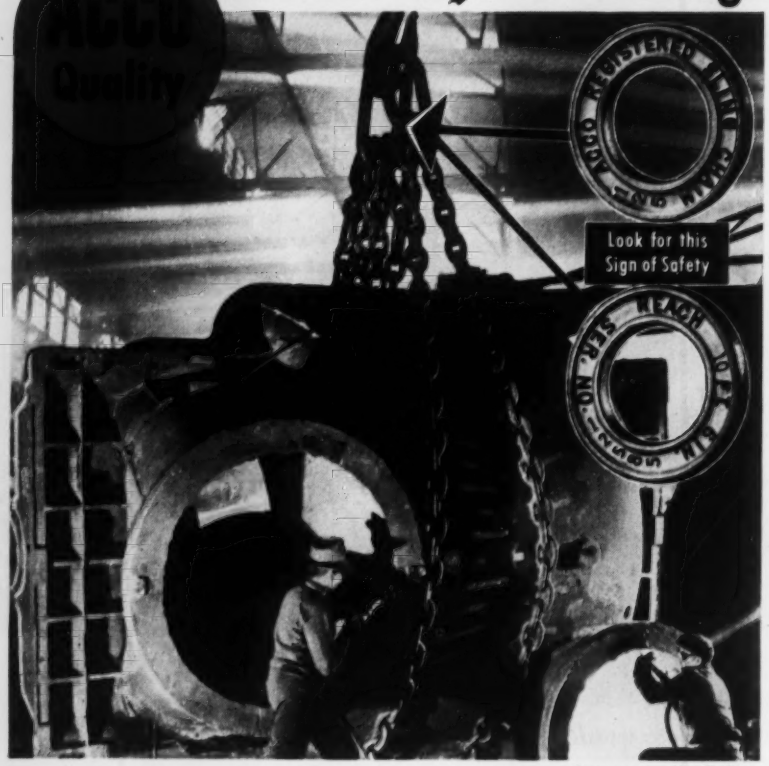


Photo courtesy Allis-Chalmers

It happens every day

• Maybe you have dropped a load in your shop. The damages, and loss of production, came to a pretty penny. But you can guard against such accidents by calling your nearby ACCO *Registered* Sling distributor.

From him you can get a variety of sling chains to the length you need, with your choice of sling, grab, or foundry hooks and fittings that will fit the sling exactly to your work. For instance, you can get ACCOLOY sling chains in sizes from ¼" to 1¼" that have four-leg working load limits from 9,500 lbs. to 199,000 lbs. at a 60° angle. These limits are not theoretical. They are based on actual proof-testing of each completed ACCO *Registered* Sling Chain to insure safe operation.

Don't wait until you have an accident. Check today with your ACCO *Registered* Sling distributor or write our nearest district office for further information.

WHAT "ACCO REGISTERED" MEANS...

1. The best material
2. Unit safety factor (on bodies, rings, links, hooks)
3. Proof test of complete sling to twice the working load limit
4. Actual field service test of each design
5. Metal identification ring on each sling
6. Signed Registry Certificate with each sling

*Trade Mark Registered

ACCO

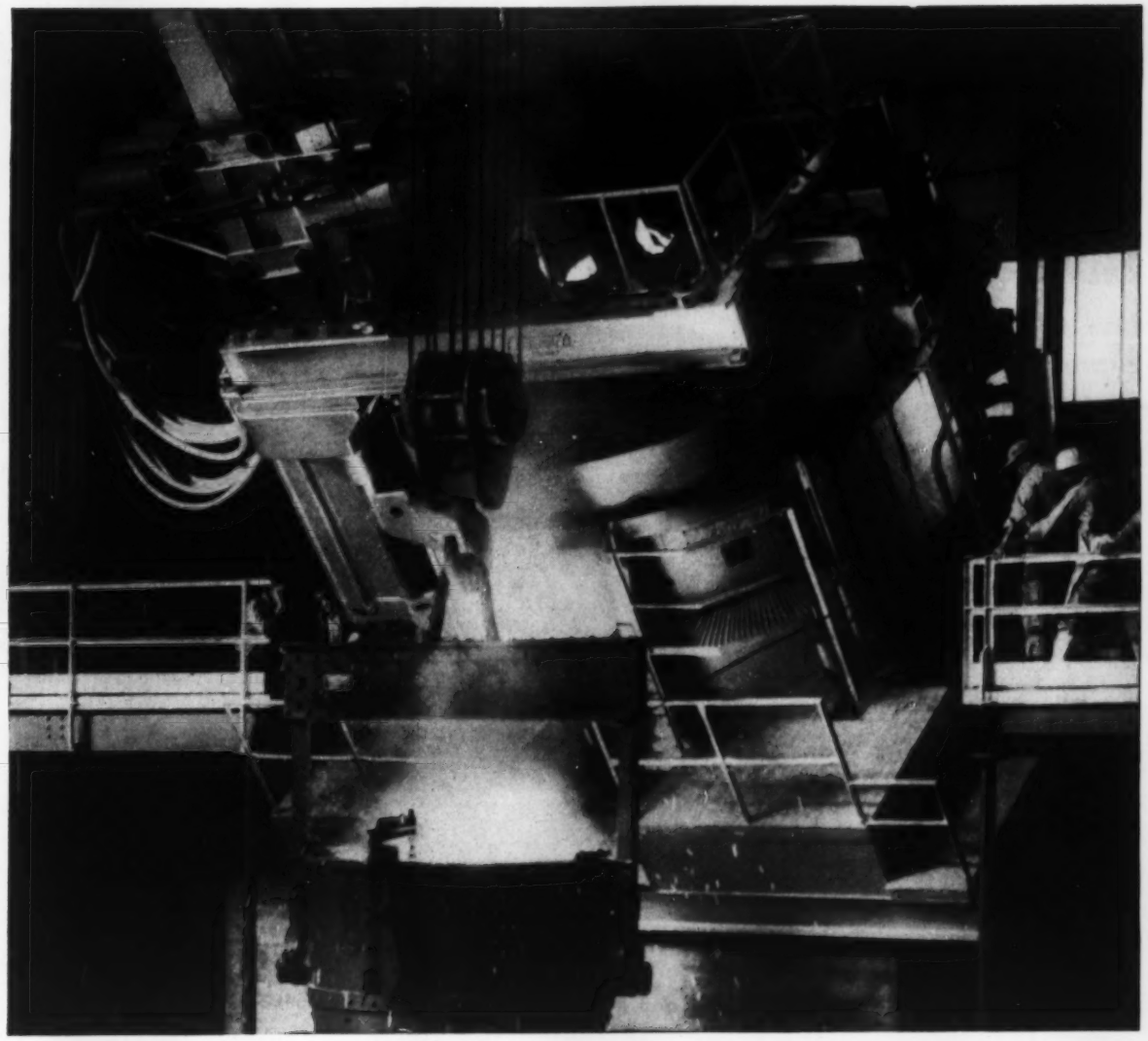
TRADE MARK

American Chain Division
AMERICAN CHAIN & CABLE

York, Pa., Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Sterling Electric Motors Inc. Los Angeles	1446
Edwin B. Stimpson Co. Inc. Brooklyn, N. Y.	1701
F. J. Stokes Machine Co. Philadelphia	2167
Sub-Zero Products Co. Cincinnati	1630
Sunbeam Corp., Industrial Furnace Division Chicago	448
Superior Tube Co. Norristown, Pa.	1667
Surface Combustion Corp. Toledo, O.	714
Taco West Corp. Chicago	2245
Technical Operations Inc. Arlington, Mass.	312
Tempil Corp. New York	1523
Tenney Engineering Inc. Union, N. J.	2330
Testing Equipment Co. Inc. New York	2329
Texas Co. New York	1529
Tinnerman Products Inc. Cleveland	1208
Tin Research Institute Inc. Columbus, O.	1901
Titanium Alloy Mfg. Division National Lead Co. New York	260
Titanium Metals Corp. of America New York	226
Tocco Division, Ohio Crankshaft Co. Cleveland	160
Torit Mfg. Co. St. Paul	2350
Torrington Mfg. Co. Torrington, Conn.	2060
Torsion Balance Co., Kent Cliff Laboratories Division Clifton, N. J.	2343
Tranter Mfg. Inc. Lansing, Mich.	1353
Tubular Micrometer Co. St. James, Minn.	2236
Turco Products Inc. Los Angeles	2204
Uddeholm Co. of America Inc. New York	201
Union Carbide & Carbon Corp. New York	653
U. S. Electrical Motors Inc. Los Angeles	2012
United States Plywood Corp. New York	2240
Universal Castings Corp. Chicago	2148
Universal Tumbling Supply Co. Detroit	2253



*Lectromelt** FURNACES...preferred all over the world

Its many outstanding features have made Lectromelt the favored furnace in 35 nations for melting, smelting, refining or reduction.

- Power supply and power regulation are engineered specifically for each installation.
- Lectromelt provides more precise control of temperature and analysis.
- Top charging saves on labor, power, furnace lining and electrodes.
- Roof lift and swing mechanism is separately mounted.
- Lectromelt furnaces have a reduced inertia electrode mechanism.
- Tilt mechanism is side mounted.
- Each furnace is floor assembled in our factory for assured mechanical operation.

Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pa.

Manufactured in . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris... BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege... SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

*REG. T. M. U. S. PAT. OFF.

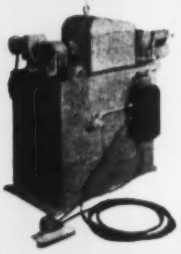
WHEN YOU MELT.. MOORE RAPID *Lectromelt*

4 COST-CUTTING SOLUTIONS

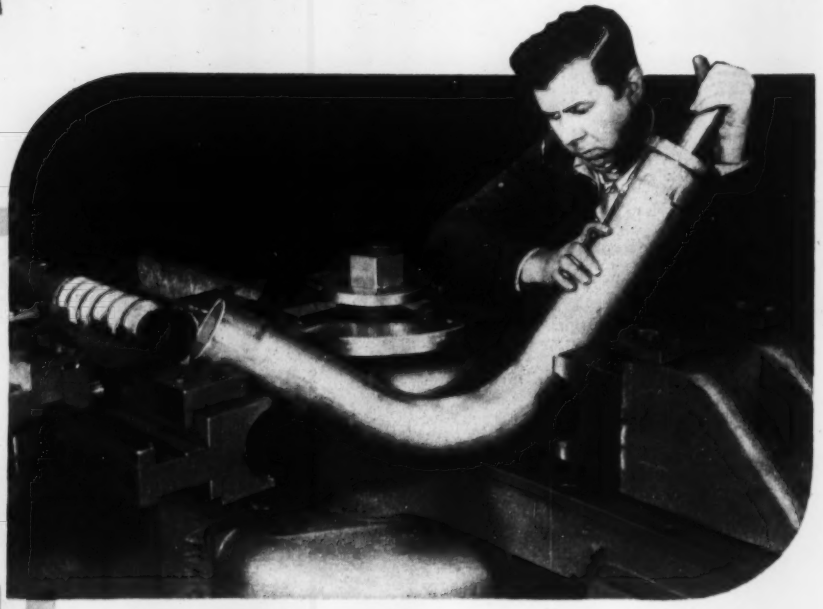
FOR FABRICATORS OF TUBING, PIPE, MOLDINGS AND EXTRUDED SHAPES

PINES 20-TON BENDING PRESS— Speeds production of automotive tail pipes, completes some jobs 50% faster by eliminating work handling. Up to 10 bends produced in a single progressive operation, most jobs completed in one handling.

PINES SEMI-AUTOMATIC BENDER— Capacity up to 300 bends per hour, for applications where output does not require speed of fully automatic machines. Hydraulic power assures accurate, highly uniform results. Economically tooled, easy for women to operate, requires up to 60% less floor space.



PINES END-FINISHING MACHINE— 3" capacity, floor-mounted unit with air clamping. Speeds deburring, facing, pointing, or light hollow mill turning. Available with manual or air spindle advance. Other units also provided for smaller and larger work.



PINES SIZE 4 BENDER— Now cold forms ultra-thin 4" x .020" stainless steel tubes for aircraft to 8" c/l radius. Ability to form these sharp, small radius bends without wrinkles saved $14,000 per plane for an aircraft manufacturer.

● Since 1941, when Pines Automatic Hydraulic Bending Machines were first introduced, more and more plants fabricating tubing, pipe, rods, moldings, rolled and extruded shapes, have found it profitable to standardize on Pines Machines. Dependable accuracy, combined with fast, more efficient operation are two of the major reasons why hundreds of commercial and industrial plants have turned to Pines to find cost-cutting solutions to bending and end-finishing problems. A study of the four examples shown here may suggest how you may profitably take advantage of the latest developments in fabricating the "Pines-way".

WRITE FOR *Free* DATA SHEETS

For additional cost-cutting ideas, write today for free copies of "Pines News"—illustrates latest bending and end-finishing techniques applied to actual jobs. And call on Pines engineers for assistance on any job.

PINES ENGINEERING CO., INC.

Specialists in Tube Fabricating Machinery

662 WALNUT • AURORA, ILLINOIS

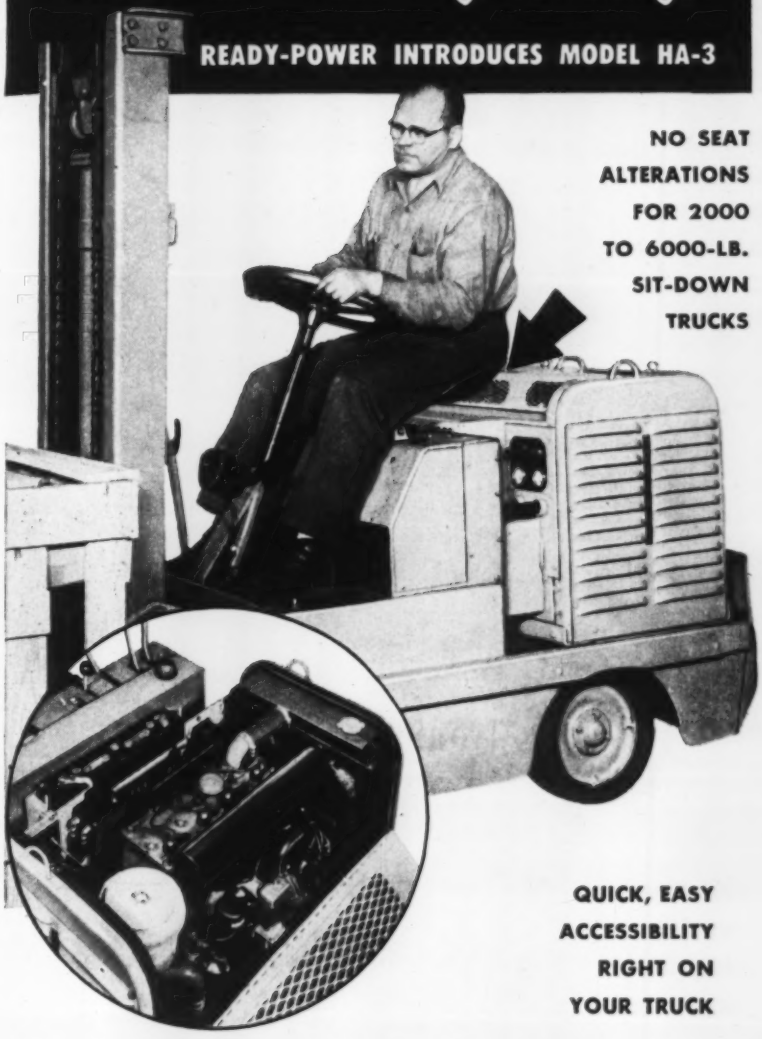
PRODUCTION BENDING • DEBURRING • CHAMFERING MACHINERY

METAL SHOW EXHIBITORS

EXHIBITORS	BOOTH NO.
Uniworld Research Corp. of America Cleveland	126
Upton Electric Furnace Co. Detroit	1118
Utica Drop Forge & Tool Co. Utica, N. Y.	233
Vacu-Blast Co. Inc. Belmont, Calif.	1450
Vacuum Equipment Dept. Consolidated Vacuum Corp. Rochester, N. Y.	2156
Vacuum Metals Corp. Cambridge, Mass.	1250
Vanadium Corp. of America New York	320
Versa-Mill Co. New York	1359
Verson Allsteel Press Co. Chicago	1316
H. J. Volz Machinery Co. Chicago	2256
W. W. Alloys Inc. Division Fansteel Metallurgical Corp. Detroit	1559
Waldes Kohinoor Inc. Long Island City, N. Y.	1556
Walker-Turner Division Kearney & Trecker Corp. Plainfield, N. J.	2117
Wallace Supplies Mfg. Co. Chicago, Ill.	310
Waukee Engineering Co. Milwaukee, Wis.	1121
Weatherhead Co. Cleveland	2046
Webber Mfg. Co. Inc. Indianapolis	1656
Wells Mfg. Corp. Three Rivers, Mich.	219
Weltronic Induction Heating Corp. Oak Park, Detroit	163
West Instrument Corp. Chicago 22, Ill.	2245
Westinghouse Electric Corp. Pittsburgh, Pa.	360
Wheelco Instrument Division Barber-Coleman Co. Rockford, Ill.	1219
S. B. Whistler & Sons Inc. Buffalo	135
Willey's Carbide Tool Co. Detroit	2146
Wilson Mechanical Instrument Division American Chain & Cable Co. Inc. New York	1228
Worcester Pressed Steel Co. Worcester, Mass.	2001
Yale & Towne Mfg. Co. Powdered Metal Products Division Franklin Park, Ill.	2260

New Interchangeable Gas-Electric Power Unit Gives Big Advantages

READY-POWER INTRODUCES MODEL HA-3



NO SEAT ALTERATIONS FOR 2000 TO 6000-LB. SIT-DOWN TRUCKS

QUICK, EASY ACCESSIBILITY RIGHT ON YOUR TRUCK

Now, Ready-Power offers a new continuous-duty power unit designed especially for sit-down electric trucks. It installs quickly . . . the recessed housing eliminates seat alterations . . . operation is exceptionally quiet.

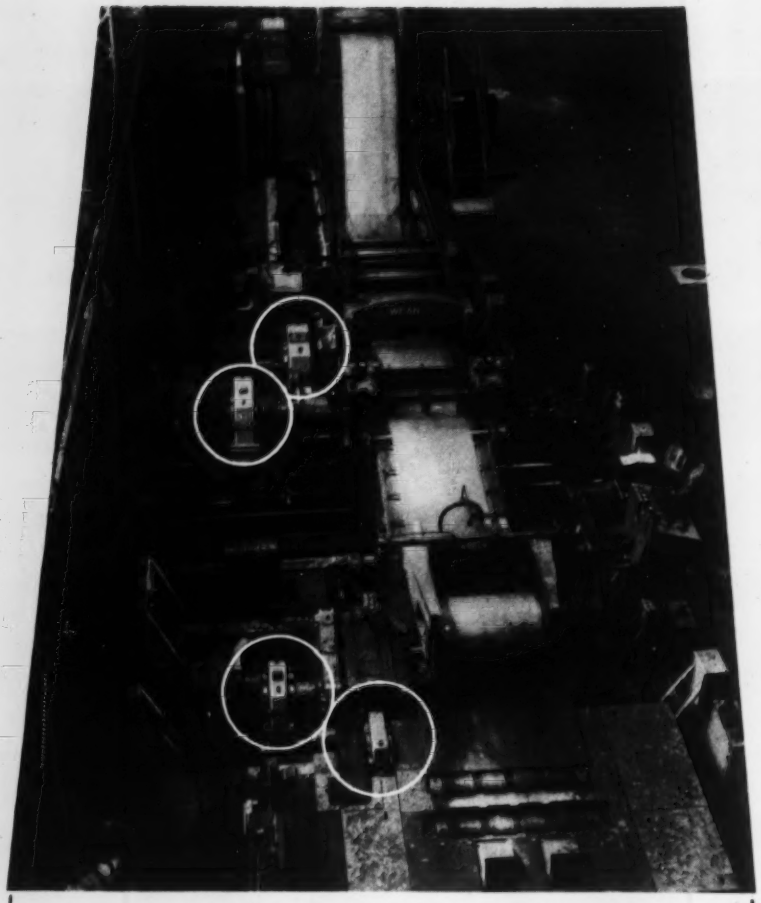
Designed for quick, easy maintenance, Model HA-3 has a hinged cover and side plate for access to engine and generator when servicing on the truck.

Only Ready-Power gives you the advantages of *interchangeable* gas-electric and diesel-electric power plus dependable, low-cost performance. Write for details.

READY-POWER

The READY-POWER Co., 3824 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks



Proven Trouble Free Service and Economy of Operation

The Wean Engineering Company have built and installed continuous pickle lines (similar to the one illustrated above) in most of the leading steel companies . . . and for many years have *specified* H & S Reducers and Pinch Roll Drives. By experience Wean has proved that H & S products give trouble free service and economy of operation due to their exceptionally Rugged Construction and Ample Overload Capacity.

It will pay you to learn more about the high quality and superb construction of H & S products.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
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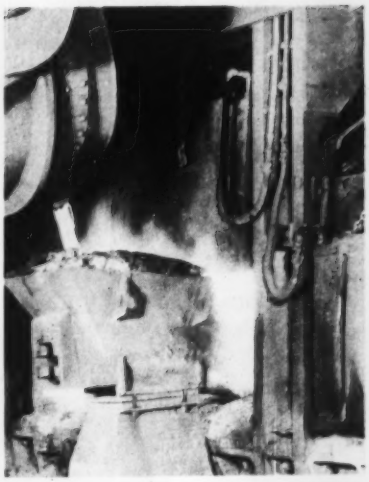
Send note on Company Letterhead for 488-Page Catalog 49



Rubber Hose Defies Heat

Armored with wire for strength and protected by asbestos for heat, a rubber hose developed by B. F. Goodrich Co.'s Industrial Products Division has defied more than 270 heats of an open hearth. The hose, circulating water inside the door to keep it from melting, provides a connection to the water circulation system so doors may be opened to charge. Being light and flexible, the hose is easy to install

Broaching Kingpin Holes

Kingpin holes in automobile front axles are being broached accurately at high rates of speed on a special Colonial Broach Co. machine.

Key to this is the simple fixture devised by their engineers that supports the I-beam during the broaching operation.

A vertical pull-down unit, Model No. BM-144, handles the job. It is rated at 6 tons and has a 24-in. stroke.

Smooth Action—Two simple fixture sections locate and support the axle. Despite the construction of the part, the fixture does not include a clamp. The smooth action of the broach being pulled through the part and the fixture section is sufficient to hold the axle in rigid and accurate contact with the fixture during the working stroke.

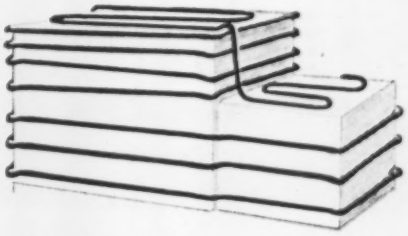
A second section of the fixture is comprised of two blocks, one rigidly mounted to the fixture base with the block mounted at an angle on top.

Working with this simple fixture arrangement the operator lowers the axle mounting pad onto the

FROM *the Bundy Sketchbook*
TO *jog a designer's imagination*

SWEATER DRYING FORM

LEGS FOR MODERN DESK

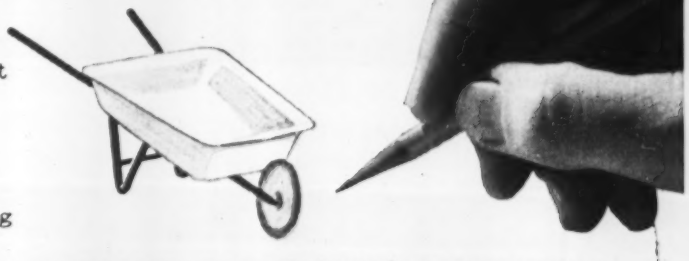


COILS FOR HOME FREEZER

REMARKS Are complicated tubing snarls eating into profits? Why not let skilled Bundy engineers show you how to simplify fabrication operations; save time, money, materials. Why not check, too, the advantages of using strong, lightweight Bundyweld, the only tubing double-walled from a single metal strip.

WRITE today for catalog or for help in developing your tubing application.

BUNDY TUBING COMPANY
DETROIT 14, MICHIGAN



FRAME FOR TOY WHEELBARROW

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . .

continuously rolled twice around laterally into a tube of uniform thickness,

and passed through a furnace. Copper coating fuses with steel. Result . . .

Bundyweld, double-walled and brazed through 360° of wall contact.

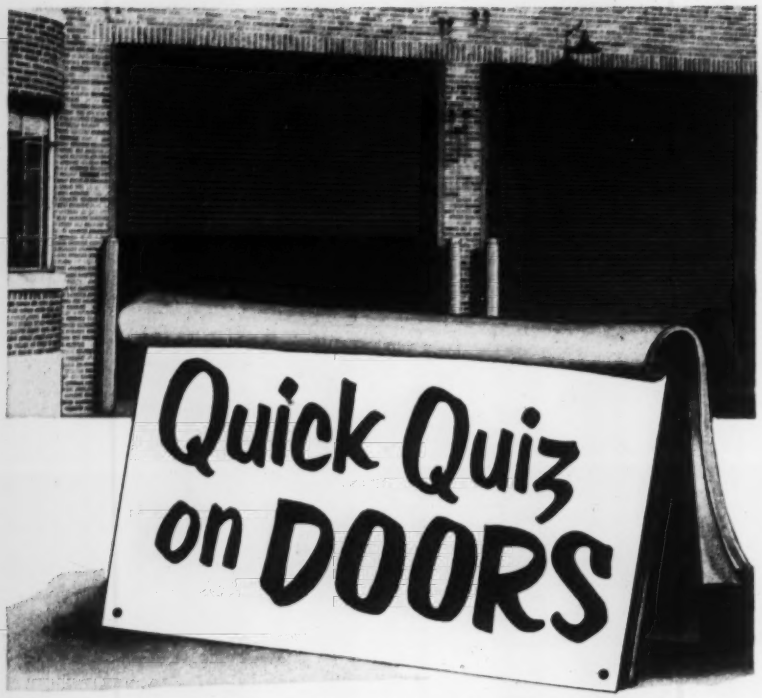
BUNDYWELD TUBING®

DOUBLE-WALLED FROM A SINGLE STRIP

Leakproof	Lightweight
High thermal conductivity	Machines easily
High bursting point	Takes plastic coating
High endurance limit	Takes plating
Extra-strong	Bright and clean
Shock-resistant	No inside bead
Ductile	Uniform I.D., O.D.

Bundy Tubing Distributors and Representatives: ***Bridgeport, Conn.:*** Korhumel Steel & Aluminum Co., 117 E. Washington St. • ***Cambridge 42, Mass.:*** Austin-Hastings Co., Inc., 226 Binney St. ***Chattanooga 2, Tenn.:*** Peirson-Deckins Co., 823-824 Chattanooga Bank Bldg. • ***Chicago 32, Ill.:*** Lapham-Hickey Co., 3333 W. 47th Place • ***Elizabeth, New Jersey:*** A. B. Murray Co., Inc., Post Office Box 476 • ***Los Angeles 58, Calif.:*** Tubesales, 5400 Alcoa Ave. • ***Philadelphia 3, Penn.:*** Rutan & Co., 1717 Sansom St. • ***San Francisco 10, Calif.:*** Pacific Metals Co., Ltd., 3100 19th St. • ***Seattle 4, Wash.:*** Eagle Metals Co., 4755 First Ave., South • ***Toronto 5, Ontario, Canada:*** Alloy Metal Sales, Ltd., 181 Fleet St., E.

Bundyweld nickel and Monel tubing are sold by distributors of nickel and nickel alloys in principal cities.



QUESTION: How can we be *sure* of door efficiency?

Answer: The upward-coiling curtain of interlocking steel slats, originated by Kinnear, *is the key to many basic door advantages.*

QUESTION: How much floor space is taken up by the doors?

Answer: You can make full use of all floor and wall space around Kinnear Rolling Doors, inside and outside the opening, at all times. *By coiling straight upward, they operate* entirely within the space they occupy when closed.

QUESTION: Can we run crane or hoist rails and other overhead equipment close to the doorway?

Answer: Yes. Kinnear Rolling Doors use no ceiling space, except for the compact hood area into which the curtain coils. This hood can often be recessed in the wall, or mounted outside the building, so that ceiling heights can be held to minimum, cutting building costs.

QUESTION: Are the doors easy to operate?

Answer: Strong torsion-spring counterbalancing makes even manual-lift Kinnear Doors extremely easy to operate. They are also ideal for motor operation—no lengthy operating cables, no projecting tracks, no bulky mechanism. Push-button controls can be placed at any number of points.

QUESTION: What about protection?

Answer: Kinnear Rolling Doors guard every opening with a curtain of steel anchored in steel jambs from floor to ceiling—a fire-resistant barrier against wind, weather, theft, or vandalism.

QUESTION: Can we count on low maintenance costs?

Answer: Many Kinnear Rolling Doors have been in continuous daily use upwards of 20, 30 and 40 years without repair or maintenance expense, *as proved by reports from many users.*

QUESTION: What about corrosion resistance?

Answer: A heavy coating of pure zinc (1.25 ounces per square foot, ASTM Standards) applied by the hot process, gives Kinnear Rolling Doors a highly durable galvanized finish. In addition Kinnear's special Paint Bond, a phosphate immersion treatment, provides for thorough coverage and adherence of paint.

QUESTION: What if the doors are damaged?

Answer: The steel slat construction of Kinnear Rolling Doors absorbs a lot of punishment. Slats accidentally damaged can be individually replaced any time. Detail drawings of every door are kept in Kinnear's own fireproof vaults.

QUESTION: What sizes are available?

Answer: Kinnear Rolling Doors are engineered to individual needs, in any practical size (doors several hundred square feet in area are not unusual). They are easily installed in new or old buildings.

In short, you get *all* the correct answers to long-lasting, low-cost door convenience and efficiency in the famous

Kinnear Steel Rolling Doors

Write today for full information

The KINNEAR Manufacturing Co.
FACTORIES:
1780-1800 Fields Avenue, Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in All Principal Cities

SAVING WAYS in DOORWAYS
KINNEAR ROLLING DOORS

angle support block and with the broaching tool aligns the kingpin hole with the locating hole in the first section of the fixture.

The rough kingpin holes on the steel forged I-beam axle are 0.906 in. in diameter. After broaching, the hole has a 0.922-in. diameter and a length of 2.435 in.

Expanded Metal

Expanded metal is being used to replace many hand hammered items for consumer use.

The process for expanding metal was originated in Europe. Improved through use of specialized machinery and mass production techniques, the process promises to develop into a major production phase of the American steel industry.

Wide Use Range—Using a variety of sizes and gages, from 20 gage to ⅜ inch, Wheeling Corrugating Co. turns out expanded metal ready for uses ranging from reinforcing mesh to intricate decorator items.

Hand hammered items of the thirties were the result of a slow laborious process. Expanded process now allows for utilizing of the metal in items on a mass production basis heretofore impossible. The metal also offers advantages of strength and light weight.

Aluminum Study

A comprehensive study of aluminum extrusions has been prepared by Harvey Aluminum.

The vast and inexhaustible uses to which the aluminum extrusion can be applied in new design are pointed out. Aid is given those now using aluminum extrusions for improving existing designs.

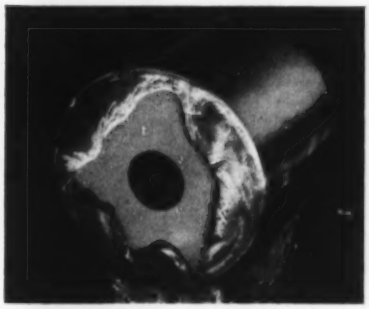
Subjects — Technical material covered in the 36-page text includes current applications, design advantages, fabricating, finishes, general characteristics, etc. Data-packed charts, illustrations and sketches are used to supplement the detailed text.

The study is available from Harvey Aluminum, 19200 S. Western Avenue, Torrance, California. Requests must be made on company letterhead. Additional copies are available for $1.50 each.

THREE DIFFERENT BREAKS in two years. Each would have normally condemned this costly equipment to the scrap heap.

This 5-ton cast-iron column of a drop-forge hammer was braze-welded with Anaconda Tobin Bronze Rod

"We've done many jobs of this type," says Wilson E. Campbell, Sr., President of Industrial Welding & Brazing, Inc., Lansing, Michigan, "but repairing this 10,000-lb. column casting for a drop hammer was as tough as any. Yet we fixed it up not once but three times –in three *different* places–each time as good as new.



REBUILT INSIDE AND OUT with Tobin Bronze. Large punch press connection was bored for the bearing and ground off outside.

"Last year," Mr. Campbell continues, "we repaired over a thousand different parts for *one* large auto maker. We did most of this work with Tobin Bronze–our favorite welding rod for over 30 years."

Why does Industrial Welding like braze-welding for repair work? It's economical and dependable, and needs less preheating. High stresses don't build up, and there is less danger of cracking.

Why Tobin Bronze* Welding Rod? Mr. Campbell reports: "Tobin Bronze Welding Rod flows freely–'tins' fast–bonds strong and sound. It's good for a wide variety of repair welds–engine blocks, cast-iron pipe, machinery parts and other equipment."

Purity Cylinder Gases, Inc., with headquarters at Grand Rapids and branches in western Michigan and northern Indiana, supplies Industrial Welding with all their rods. Like Purity, there are Anaconda distributors throughout the United States ready to help you with your welding problems–and to serve you with the Anaconda Welding Rod best suited to your particular repair and production job. *The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.*

*Reg. U. S. Pat. Off. 54139

ANACONDA®

WELDING RODS

Anaconda Copper-372 • Tobin Bronze-481 • Anaconda-997 (Low Fuming) Bronze • Nickel Silver-828 • Cupro Nickel-826 • Everdur-1010 • Ambraloy-928 • Phosphor Bronze-351 • Phosphor Bronze-354

CHEMICAL USERS' GUIDE To General Chemical Products for the Metal Industries

PRODUCT	AVAILABLE FORMS	COMMERCIAL STRENGTHS	SHIPPING CONTAINERS	APPLICATIONS
Sulfuric Acid H_2SO_4	Liquid	66° Be (93.19%) 99% Oleum, 20-65%	Carboys (except Oleum) Steel Drums Tank Trucks Tank Transports Tank Cars	Pickling and descaling; electroplating; bright dipping; electrolytic polishing; galvanizing; anodizing.
Hydrochloric Acid HCl + water *(Muriatic Acid)*	Liquid	18° Be (27.92%) 20° Be (31.45%) 22° Be (35.21%)	Carboys Tank Trucks Tank Cars	Pickling; electroplating; bright dipping; galvanizing; tinning; etching metals; dissolving metals.
Nitric Acid HNO_3 + water	Liquid	36° Be (52.30%) 38° Be (56.52%) 40° Be (61.38%) 42° Be (67.18%) 95%	Carboys (except 95%) Drums Tank Cars	Pickling; electroplating; bright dipping; oxide finishing; dissolving and stripping metals.
Hydrofluoric Acid HF + water	Liquid	60% 70%	Steel Drums & Tank Cars	Pickling; electroplating; electrolytic polishing; bright dipping.
Sodium Fluoride NaF	White Powder	95% or 97% Light or Dense	Multiwall Paper Bags Fibre Drums	Manufacture of rimmed steel; heat treating; galvanizing; pickling; electroplating.
Sodium Bifluoride $NaHF_2$	White Powder	95% or 97% NaF • HF	Fibre Drums	Electroplating.
Trisodium Phosphate $Na_3PO_4 \cdot 12H_2O$ *(TSP)*	Crystal	P_2O_5—18.4%	Multiwall Paper Bags Fibre Drums	Alkali cleaning.
Sodium Metasilicate $Na_2SiO_3 \cdot 5H_2O$	White Granules	98.5%	Multiwall Paper Bags Fibre Drums	Alkali cleaning.
Oxalic Acid $C_2H_2O_4 \cdot 2H_2O$	Colorless Crystals	99.5%	Multiwall Paper Bags Fibre Drums	Oxide finishing; metal cleaning.
Potassium Fluoborate KBF_4	White Powder	97.0%	Fibre Drums	Aluminum and magnesium casting; as a flux and grain refiner for aluminum; for removing magnesium from secondary aluminum alloys.
Sodium Fluoborate $NaBF_4$	White Powder	94.0%	Fibre Drums	
Ammonium Fluoborate NH_4BF_4	White Powder	96.0%	Fibre Drums	Aluminum and magnesium casting; electroplating.
Fluoboric Acid HBF_4 + water	Liquid	42.0%	Rubber Drums	Electroplating; metal cleaning or dipping; electropolishing.
Lead Fluoborate $Pb(BF_4)_2$ + water	Liquid	51.0%	Carboys	Electroplating.
Tin Fluoborate $Sn(BF_4)_2$ + water	Liquid	47.0%	Carboys	Electroplating.
Copper Fluoborate $Cu(BF_4)_2$ + water	Liquid	45.0%	Carboys	Electroplating.
Iron Fluoborate $Fe(BF_4)_2$ + water	Liquid	45.0%	Carboys	Electroplating.
Nickel Fluoborate $Ni(BF_4)_2$ + water	Liquid	42%	Carboys	Electroplating.

The products advertised are commercial chemicals having various uses, some of which may be covered by patents, and the user must accept full responsibility for compliance therewith.

OTHER PRODUCTS: Acetic Acid; Ammonium Thiosulfate Solution; Aqua Ammonia; Barium Fluoride; Chromium Fluoride; Copper Fluoride; Copper Sulfate; Glauber's Salt; Iron Sulfide; Nickel Fluoride; Perchloric Acid; Sodium Bisulfite, Anhydrous; Sodium Silicate; Sodium Sulfite, Anhydrous; Stannous Chloride; Tetrasodium Pyrophosphate; Phosphoric Acid; Sodium Tripolyphosphate.

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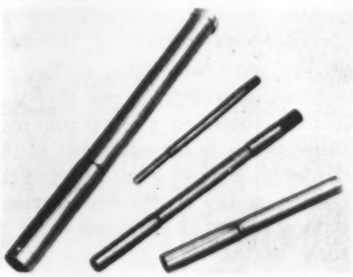
Tungsten Carbide Coating

FLAME-PLATING of core rods with tungsten carbide has made them last 30 times longer than steel rods, according to tests run by a Midwestern metal products manufacturer.

Before coating, rods were no longer usable after 10,000 parts had been produced because of an 0.0001-in. wear limit. Flame-plated, they produced 291,905 parts at last count and showed no noticeable wear. When the rod finally does wear undersize, a tungsten carbide coating may be applied again and reapplied again. This results in substantial savings in downtime and replacement costs.

What It Is—This process, developed by Linde Air Products Co. Division, Union Carbide & Carbon Corp., deposits a thin coating of tungsten carbide on the surfaces of parts and tools where extra wear-resistance is required. In this manner, a tool such as a core rod can be given a wear-resistant surface while retaining the toughness of the base metal, minimizing the breakage problems.

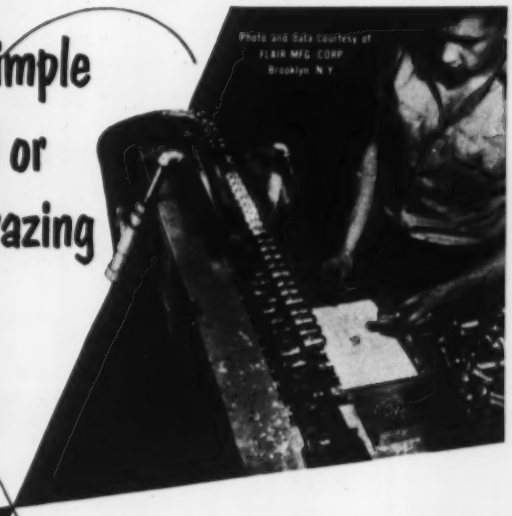


FLAME PLATED RODS
. . . increases wear resistance

Finished and semi-finished parts can be plated without causing distortion or change in the physical properties of the base metal because temperature of the part being plated does not exceed 400° F. The coating may be left in as-coated condition or finished down to 1-5 microinches rms.

Tools such as plug and ring gages, turbine shaft seals, gripping dogs, wire straightening rollers, spindles and bushings are being Flame-Plated with success.

Amazingly simple EASY-FLO or SIL-FOS brazing pays big dividends



★ **EASY DOES IT**—An endless chain runs at predetermined speed between a pair of city gas-air burners. Operator places bodies in angle-iron carriers, takes spuds with preplaced EASY-FLO rings, dips them in Handy Flux and sets them in bodies. The rest is automatic. Using only one row of carriers, output is 18 a minute.

Expert "Know-how" at your service

In cooperation with the manufacturer we worked out the valve brazing set-up – and we're ready to work with you. As originators of EASY-FLO and SIL-FOS low-temperature silver brazing alloys, we offer you the benefit of the maximum technical knowledge about the process and practical experience in its application available anywhere today. There's no obligation for this assistance. Just phone or write when you would like a field service engineer to call.

It's a safe bet you can get a better product at much lower cost on several of your metal parts by designing them for EASY-FLO or SIL-FOS silver brazed construction – supplemented by a simple production set-up that makes the brazing so easy – *anybody can do it!*

Here's an example – a radiator valve. It is made of a simple drawn body and a screw machine part, brazed with EASY-FLO. And the joining is done on a set-up that "automation-izes" the actual brazing. The net results – a smaller, trimmer valve – and a favorably low production cost.

FOR THE FACTS IN PRINT...

Write for Bulletin 20. It gives them all plus a lot of useful information about fast, low-cost production brazing.

At the METAL SHOW—Chicago—Nov. 1-5
SEE the comprehensive exhibit of low-temperature silver brazing jobs from many industries. Our engineers with the know-how will be there ready and waiting to chat with you about your metal joining. BOOTH 342

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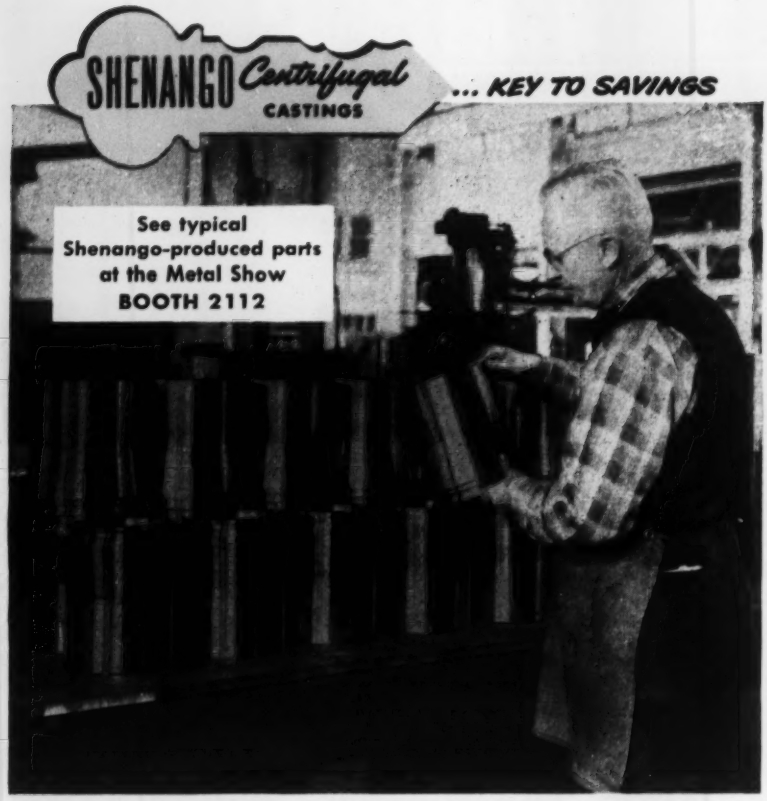


Flared bronze bushings, centrifugally cast and finish-machined by Shenango.

SHENANGO Centrifugally Cast Parts "Tailor-Made" to your specifications

A big advantage you buy with every Shenango part is the assurance the part will give the longest possible wear . . . and if precision-machined by Shenango . . . you know it will fit perfectly on delivery.

HERE'S WHY...

(1) Shenango centrifugally cast parts are more uniform and pressure-dense. They are free from sand inclusions, blowholes and other often hidden defects. (2) You specify the type metal so the completed Shenango part is actually "tailored" to last longer on your specific job. (3) Modern machining facilities and skilled workmanship give you semi- or precision-finished parts . . . precisely as specified, at minimum cost.

FREE BULLETIN No. 150 covers nonferrous metals; Bulletin No. 151 covers Meehanite Metal, Ni-Resist and special iron alloys. *Address . . .*

SHENANGO-PENN MOLD COMPANY
Centrifugal Castings Division
Dover, Ohio
Executive Offices: Pittsburgh, Pa.

SHENANGO
ALL RED BRONZES • MANGANESE BRONZES • ALUMINUM BRONZES
MONEL METAL • NI-RESIST • MEEHANITE METAL

Stem Pinion Production

High speed automatic lathes with multiple tooling cut costs of automotive parts

HIGH SPEED automatic lathes with multiple tooling have cut costs for an automobile manufacturer. The two machines, (formerly three were used) are easily handled by one operator.

The lathes permit maximum use of multiple carbide tooling. Short tool travel, to engage the work and during cutting, cuts down production time.

Work Cycle—Stem pinions are machined from SAE 4620 steel forgings in the annealed state. During rough turning in Hydra-Feed Machine Tool Corp.'s first lathe, 1¼ lb of material is removed in a 22-second cycle. Four tools are used on the top carriage and one tool is mounted on the rear carriage. Four diameters are turned by the cam controlled tools on the top carriage. A facing operation is performed by the tool on the rear carriage.

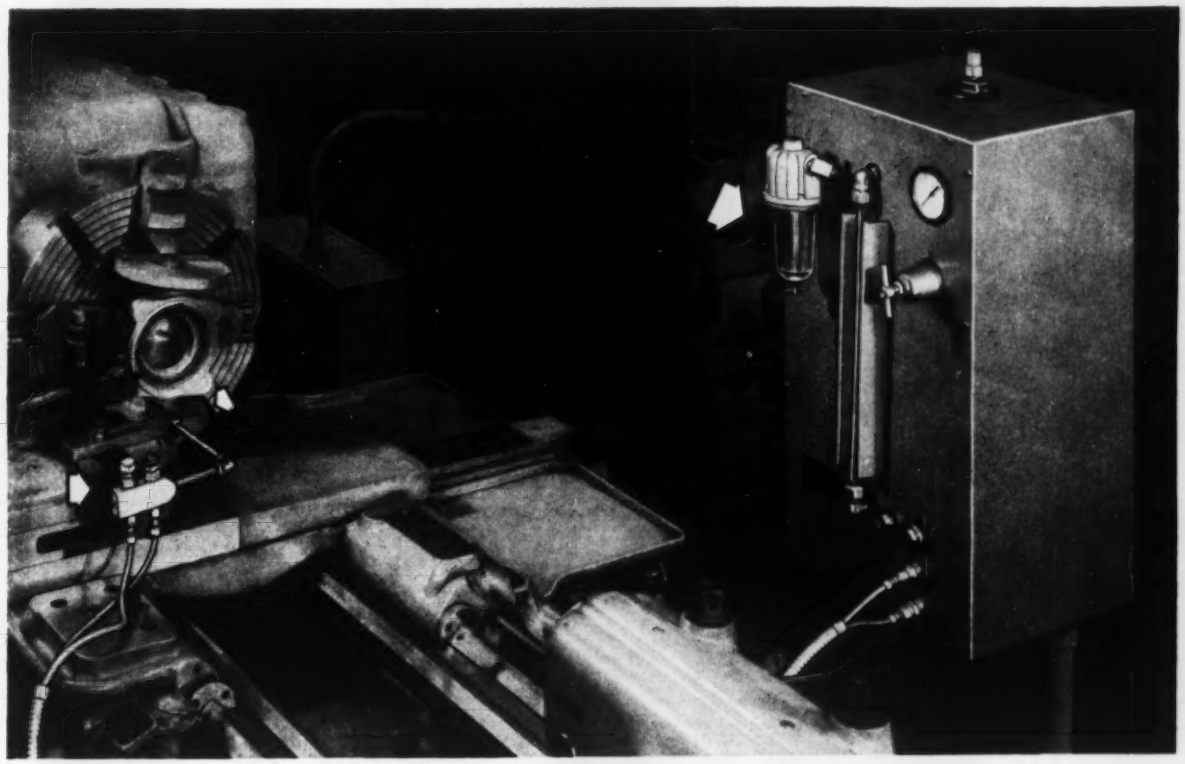
After the roughing cut, the part is transferred to the second machine where ½ lb of metal is removed in an 18-second cycle. Five tools mounted on the top carriage remove most of the metal. Six tools in the rear carriage simultaneously square up corners, chamfer and put in radii.

The Power—Tailstock and carbide driving inserts on the spindle are hydraulically powered. This enables the machine to finish turn the head of a part at the same time as cuts are being taken on the stem. The hydraulic tailstock assures perfect alignment and constant contact with the driving inserts throughout the cutting cycle. The machine is pushbutton operated.

Two Heads Bore and Face

Simultaneous cam and crank finish boring and facing operations are features of a Boreface machine made by National Automatic Tool Co. Inc.

The two-headed machine, speeds production of diesel engine blocks by finish boring cam and crank holes and boring and cross-feed



LO-JET ACRO

'TURNS-OFF THE HEAT' } turns-up profits and production

Lo-Jet Cools And Lubricates

Lo-Jet ACRO is a pressurized mist system that provides both evaporative cooling of tools and work, and lubrication, to reduce friction generated heat. Because it's pressurized, Lo-Jet delivers cooling and lubrication uniformly, too, regardless of operational conditions.

Lo-Jet Pays For Itself In Reduced Costs

Lo-Jet ACRO increases tool life 100%-300%, and the resultant savings in tool cost alone soon pay for the unit. The Lo-Jet costs less to operate, too.

Lo-Jet Increases Production

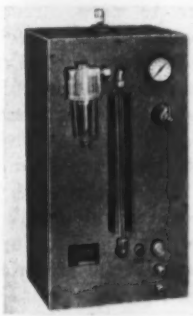
With Lo-Jet ACRO on the job, you can take heavier cuts on any work, and operate at higher feeds and speeds. And because tools last longer, there is a drastic reduction in the amount of tool-change time required.

Lo-Jet Provides Better, Cleaner, Safer Operation

The directed cooling and lubrication of Lo-Jet ACRO result in improved finishes. Lo-Jet leaves the tool and work plainly visible and clean at all times. The ACRO coolant used is fireproof, lightly pine-scented, absolutely non-toxic to humans.

Lo-Jet Is Versatile And Easy To Install

Lo-Jet ACRO is completely self-contained, and can be installed on any cutting machine in minutes! It eliminates expensive, messy pumps, sumps, and piping. It can be used in turning, grinding, milling, drilling, tapping, and reaming. It's ideal for multi-phase, high speed operations, because it can be used to control as many as six nozzles at once, with full pressure and separate controls for each tool.



Don't let your profits and production go up in smoke! Mail the coupon now for literature that tells how to improve all cutting operations with

LO-JET ACRO

AIR CONVERSION RESEARCH Corporation

3025 N. Western Avenue • Chicago 18, Illinois

GENTLEMEN: Please send me literature that fully describes the new Lo-Jet ACRO.

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Address_____

City_____ Zone____ State_____

S-10

ALDIP FLUXING SALTS
PLATING PROCESSES for ALUMINUM
COPPER PLATING PROCESSES • PICKLING
PAINT STRIPPERS • STEEL BLACKENING
METAL STRIPPERS
BRIGHT DIP • CHEM
PICKLING SALTS •
PHOSPHATING CO
STEEL POLISH • CH
CLEANERS - META
PROCESSES for ALU
PLATING PROCESS
CLEANING PROCES
METAL STRIPPERS
THE INDUSTRIES' Best KNOWN TRADEMARK!
Produce Brilliant Luster
by
Simple Chemical Immersion
BRASS
Room temperature—Non fuming chemical bright dip produces a uniform finish of high luster—Lustrabrass I for brightest finish. Data Sheet No. 34.
Lustrabrass II—more economical but does not give as brilliant a luster as Lustrabrass I. Data Sheet No. 35.
COPPER
Mirrocu chemical polish produces a mirror-bright finish on copper articles by simple immersion at room temperature. Immersion times of 10 to 30 seconds are satisfactory. Exhausting is not required, as the solution is non fuming. Data Sheet No. 26.
ALUMINUM
MacDermid Aluminum Bright Dip #2 produces extremely high luster on most non silicated alloys of aluminum. Operated at 190-220° F with immersion time of 25 seconds to one minute. Data Sheet No. 21.
STEEL
MirroFe chemical steel polish produces a mirror-bright finish on steel articles by simple immersion at room temperature. Small articles of low carbon steel develop a luster similar to chrome plate. MirroFe also deburrs without destroying tolerances. Data Sheet No. 32.
Write For Free Data Sheets
MAC DERMID
Incorporated
WATERBURY 20, CONNECTICUT
Manufacturing Facilities
also at
MICHIGAN • OHIO • ILLINOIS • CALIFORNIA

facing flywheel case simultaneously. At 85 per cent efficiency, it completes 4.3 parts an hour.

The machine's locations and diameters of the straight alignment bores are held to extremely close tolerances. The finish facing on the flywheel housing and the cover is held square with the crankshaft bore to within 0.0025-in. total indicator reading. All operations are performed with one locating of the part.

The right hand head finish bores 7 (in-line) main bearings, oil retainer and cover, 4 (in-line) camshaft bearing inserts and two holes.

At the same time, the left hand head rough, semi-finish and finish bores and cross-feed faces the flywheel housing and cover.

Redesigned Grinder

BUILT to grind two parallel faces of small work pieces simultaneously, the Gardner Machine Co.'s No. 2V-18 Vertical Double Spindle Grinder has been redesigned and improved.

Work pieces are hand loaded into openings of a circular work carrier which is mounted horizontally and power driven. A quick-acting screw release on the center clamping plate makes quick carrier change-over possible.

Vital Statistics—The machine column is a heavy iron casting. The work carrier drive has been redesigned, using a gear-type speed reducer with a 434.7 to 1 speed reduction.

Speeds with ranges from ¼ to 1 rpm are obtained from the rotary carrier by finger tip adjustment of the variable speed hydraulic mechanism.

Two 18-in. diameter Wire-Lokt Abrasive Discs are driven by 5-hp, totally enclosed motors. Solid, with no center hole, they permit the work piece to pass directly through the center of the wheels, providing a larger than normal effective grinding area. A newly designed hand-operated swing arm dresser has its pivot shaft fully enclosed and protected from the dust and grit that are encountered in grinding.

The machine grinds coil springs, carbon brushes, ceramic materials and similar small parts.

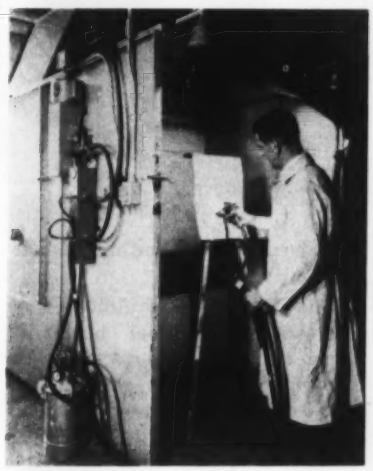
NEW PRODUCTS and equipment

Reply card on page 233 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Paint Heater

. . . utilizes hot water

The sytem is said to put efficiency into large or small painting operations. There is only one moving part, a pump for circulating hot water. Each heat exchanger



will heat up to 32 oz of material a minute. One heater will handle several heat exchangers at different points of usage.

Material to be sprayed is heated in a heat transfer unit. DeVilbiss Co.

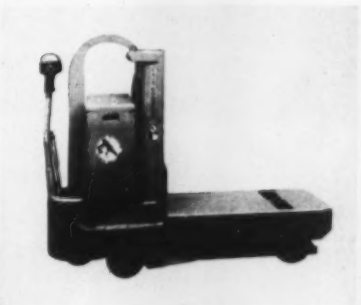
FOR MORE DATA CIRCLE REPLY CARD NO. 1

Electric Trucks

. . . low-lift, heavy capacity

With capacities up to 16,000 lb, these trucks are built with an articulated frame. It permits use of stabilizing casters on the load-carrying frame, to which the driving portion and battery are hinged by parallel linkage. Weight is distributed over the 4 rear wheels and 2 large casters.

They have an electro-hydraulic lift of 4 in. which, with the lowering action, is controlled from the handle head. The electric brake



may be released with the control handle in the vertical position, saving valuable aisle space. Lewis-Shepard Products Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 2

Platform Truck

. . . electric rider

The 4000 lb Warehouser truck will stack in a 56 in. aisle. The RL-4 (developed by the Yale Materials Handling Division) has three speeds forward and three

speeds reverse, with Time Delay controls between speeds. Steering is controlled by a wheel with spinner knob for one hand operation. Rear wheels are wide faced. Yale & Towne Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 3

Descaler

. . . uses new principle

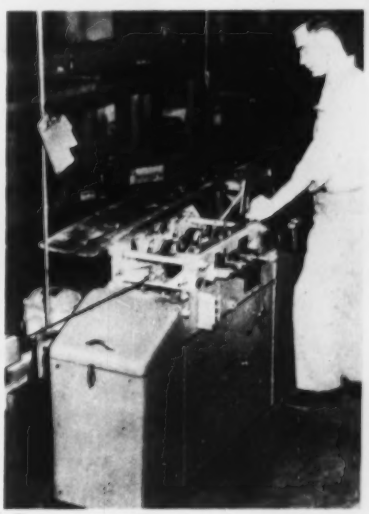
Oil hydraulics are used to actuate a compound piston, which pressurizes water up to 2000 psi. The water is directed to the hot metal surface through a cone ring orifice in an inverted spray cone pattern. A dense solid sheet edge of water strikes the hot metal surface in direct contact. A concentration of water directed over the small area minimizes the descaling temperature drop in the metal. Commercial Shearing & Stamping Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

Tube Straightener

. . . for small diameters

Syncro-Drive Model handles ⅛ to ⅝ in. O.D. tubes at straightening speeds from 60 to 300 fpm. It



uses a 2 hp variable speed drive. Setup time is particularly fast. All adjustments are easy to make. Operator visibility is excellent.

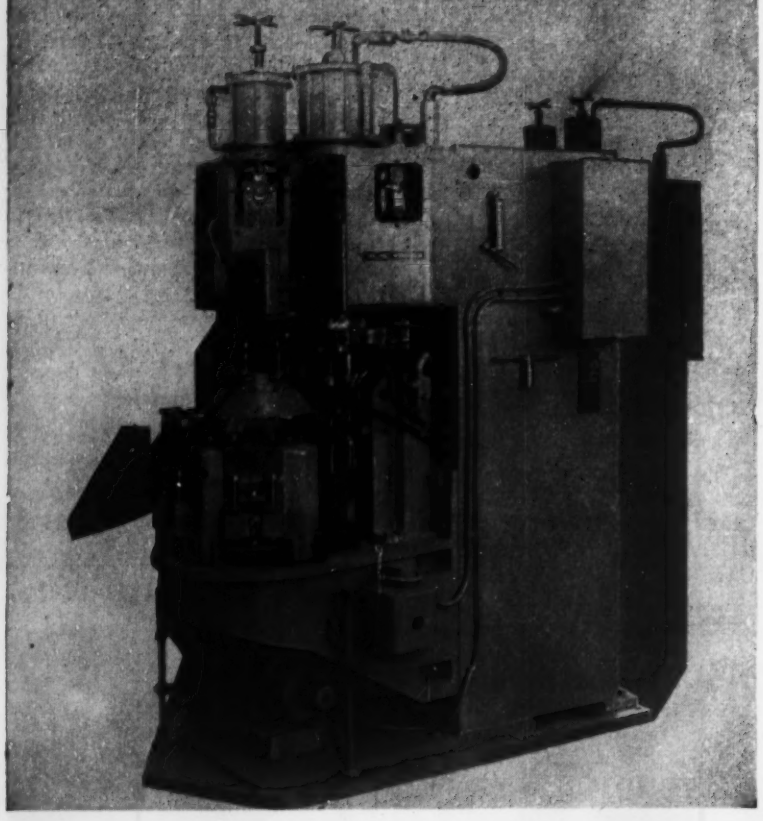
The straightener incorporates

"Let's call in T.W."

"THEIR EXPERIENCE WITH AUTOMATION OF RESISTANCE WELDERS WILL COME IN HANDY ON THIS ONE"

● "What's the best method for automatically loading and unloading resistance welders?" . . . "Can the welders be made an integral part of the production line?" . . . "What mechanical devices can be employed to make resistance welders automatic?"

Automatic resistance welding may be the production key you have been seeking to improve your costs. By calling in T-W you will gain the benefit of their work with automation as applied to resistance welding. One recommendation by T-W application men may make the big difference in your costs. T-W has the facilities, the engineers and the reputation for the best in resistance welding.



Resistance Welders Since 1898

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OAKVILLE AND WINDSOR, ONTARIO

TAYLOR-WINFIELD
RESISTANCE WELDERS

THE TAYLOR-WINFIELD CORPORATION WARREN, OHIO

NEW PRODUCTS and equipment

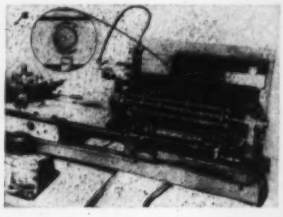
automatic co-ordination between the drive for the two larger rolls and the drive for the three smaller pressure adjusting rolls. This makes possible relatively constant surface speeds between opposed rolls for improved straightening and long roll life. Automatic centering of tube in the pass line is done without guides. Sutton Engineering Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 5

Turret Backfeed

. . . for any ram type

It is claimed that this feature makes it possible to put many cross slide operations on the turret. It is possible to make a rough cut going in and a finish cut coming out. The feeds of the infeed



and backfeed are adjusted independently.

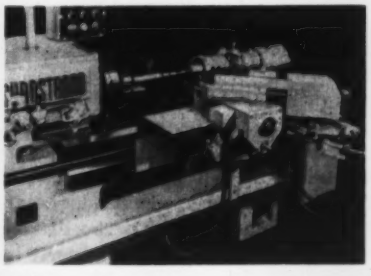
The Lynn Hydraulic Drive makes the complete machining cycle on the hex automatic; the addition of the backfeed adds more versatility to the turret. Lincoln Industries.

FOR MORE DATA CIRCLE REPLY CARD NO. 6

Tracer Control

. . . multi-cycle

For multi-cycle single point turning of irregular shapes lathes can be provided with a template



controlled tracing slide mounted to the regular front carriage. Controls, rough, semi-finish and finish cuts can be taken with one

the trend is to THOMAS... for ANGLE BENDERS too!

here's why!

1. *All-steel* welded construction . . maximum strength with minimum floor-space required.
2. Furnished complete for leg-out or leg-in angle bending . . *no extras to buy!*
3. Quick roll adjustment for width of slot . . quicker change-over.
4. Special roll combinations available for beams, channels, flats, pipe, etc.
5. Usual Thomas ruggedness and dependability, as found in all Thomas metal-working machinery.

Power Adjustment Optional

The Power Adjustment of the Movable Roll Shaft is an optional extra. It is used for quickly changing roll centers for different diameters. Machines also may be equipped with Electric Brake on the main driving motor for greater accuracy of bending.

Bulletin 314-A contains complete specifications and capacities covering the four sizes and two styles. Write.

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

38

turning tool in one automatic cycle. One template is used for all three cuts. The machine can be set up for one, two or three cycles, depending on job requirements. Regular cross feeding rear slide can be used to square up shoulder, chamfer, etc.

Cycle changing is quick and easy. The attachment is available for factory installation only. Sundstrand Machine Tool Co.

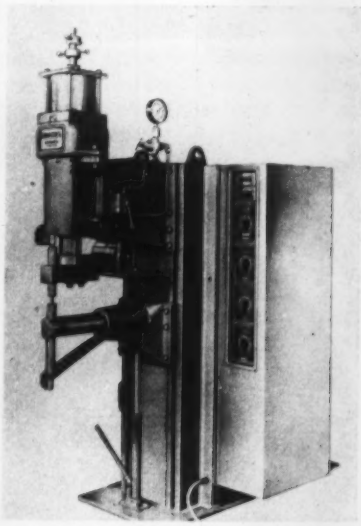
FOR MORE DATA CIRCLE REPLY CARD NO. 7

Spot, Projection Welders

. . . air operated, press type

Low impedance and single phase, both the SP 2 and EP 2 are one of a series of this type welders available in 100 KVA and 150 KVA at 50 per cent duty cycle. The EP 2 can be supplied from 12 to 30 in. throat depth and has an electrode force of 3000 to 4000 lb maximum. The SP 2 can be supplied from 18 to 48 in. throat depth and has an electrode force of 2250 to 4000 lb maximum.

The SP 2 illustrated is said to make high quality welds on large production runs on a wide range



of gages of clean mild and stainless steel. By varying weld time, weld current and electrode force, even heavier gages can be joined at lower speeds. Sciaky Bros. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 8

The Production-WISE
ROLL FORMING MACHINE

ARDCOR MODEL 1-F

Spindle Diameter	1½"
Roll Diameter	4¼" to 7"
Horizontal Distance Between Spindles	12"
Roll Space on Standard Machine	10"
Capacity Max.	.072

ADAPTABILITY — Ardcor Standard Forming Machines feature "unit construction" for each stand. Thus production changes are easily and quickly made. With this feature, any length base can be furnished to accommodate additional units as required.

Ardcor Roll Forming machines embody the precision, accuracy and stability found only in the highest grade machine tools. In addition, Ardcor offers a completely engineered installation—cradle reels, roll forming machines, roller dies, flying cut-off fixtures, etc. —from one qualified source.

Likely as not your special shapes can be ideally handled by a standard Ardcor machine. Your inquiry is invited—without obligation.

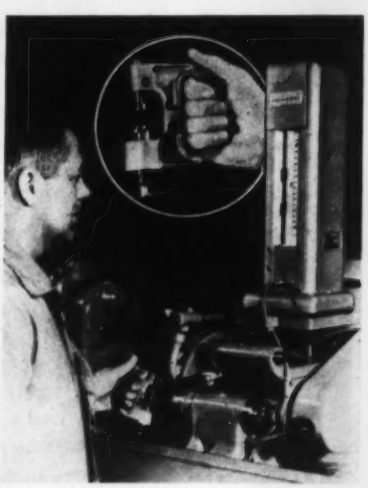
Machines Available In All Spindle Diameters

American ROLLER DIE CORPORATION
29520 Clayton • Wickliffe, Ohio

Airsnap Gage

. . . adjustable

Twelve models are available, providing a graduated size range



from 0 to 12 in. in 1 in. increments. The gaging cartridge is interchangeable, providing a gaging range from 0.001 to 0.080 in. and amplifications from 62.5 to 5000 to 1.

It is particularly useful for in-

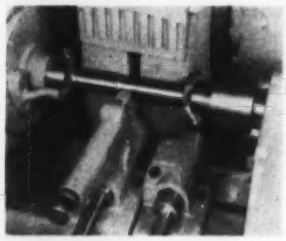
specting short runs and small quantities of different size parts. It is easy to set up. Gaging pressure is sufficient for positive alignment of the gaging anvils on the workpiece. Pressure can be lightened for gaging thin-walled parts. Sheffield Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 9

Plain Cylindrical Grinder

. . . for use on wide wheels

These hydraulic grinders are for finishing parts requiring wide or large diameter wheels. Wheels up to 10 in. wide can be used, also spaced wheels for multiple diameter or profile grinding up to 10 in.



from outside to outside of wheels. Some work pieces requiring large diameter wheels for clearance of webs can be handled on 36 in. diameter wheels.

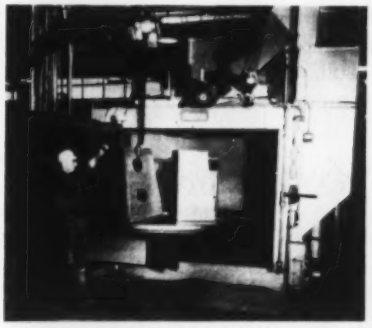
Grinders are made in 10 and 14 in. swings. Longer lengths are made on special orders. Landis Tool Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 10

Blast Cleaner

. . . table type

Airless blasting for cleaning and peening uses requiring no pit for



the abrasive hopper. That's the 72 in. Wheelabrator Swing Table. The whole machine is built for level installation.

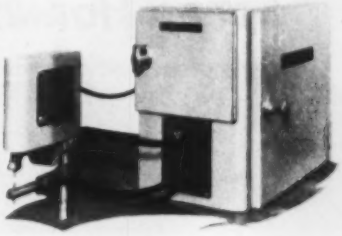
Work height clearance is 40 in. Intended for cleaning castings, forgings, heat treated parts, etc., the table holds several large or hundreds of small parts. It is used to clean in connection with the reconditioning and deflashing of plastics and die castings and prepares parts for galvanizing, rubberizing, painting, etc. American Wheelabrator & Equipment Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 11

Control

. . . for small spot welders

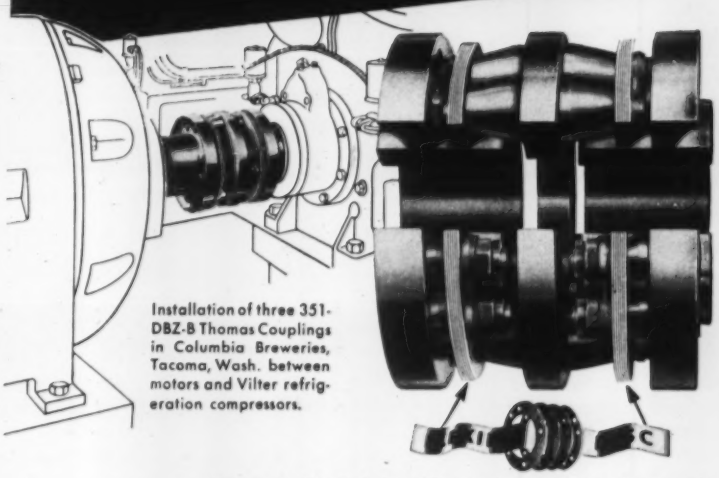
This electronic welder control is for use with manually operated small spot welders operating from single-phase ac. Controls and trans-



former are housed in one unit.

This type welder is used on in-

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!



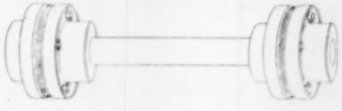
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.

Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



Write for our new Engineering Catalog No. 51A

THOMAS

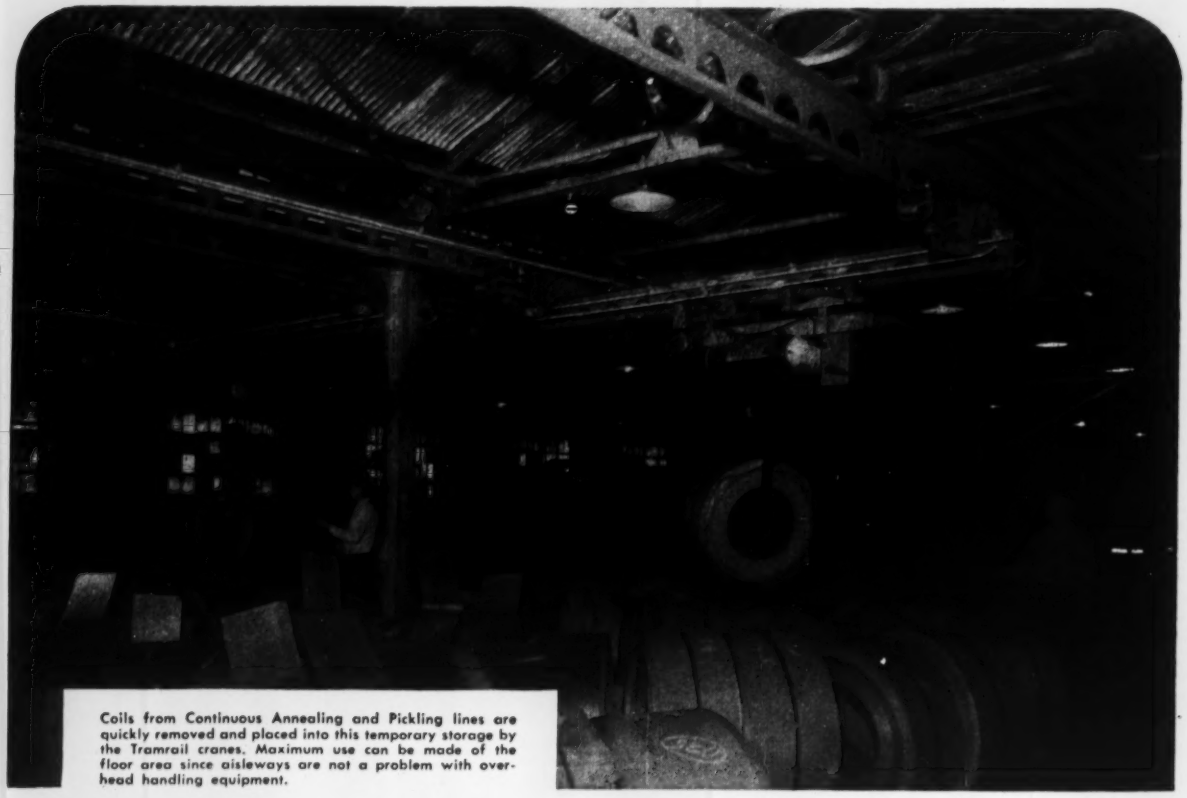
THOMAS FLEXIBLE COUPLING COMPANY

Largest Exclusive Coupling Manufacturer in the World

WARREN, PENNSYLVANIA, U.S.A.

Tramrail Cranes BOOST Strip Production

Speed Handling—Cut "Down Time"—Aid Safety



Coils from Continuous Annealing and Pickling lines are quickly removed and placed into this temporary storage by the Tramrail cranes. Maximum use can be made of the floor area since aisleways are not a problem with overhead handling equipment.

AS a leading producer of high quality alloy strip steels, mostly of light gauge, the Superior Steel Corp., Carnegie, Pa. has secured definite production advantages and greatly improved overall plant efficiency through abundant use of Cleveland Tramrail cranes.

As the work is primarily that of rolling, annealing, pickling and handling, to obtain maximum production from their equipment, it is necessary to keep it in operation as many minutes out of the day as possible. This means that there be no delays in handling the coils of strip to and from the mills. It also means that the mill rolls must be changed in the least possible time. The Tramrail cranes have proven of great success in fulfilling these requirements and reducing "down time" to a minimum.

They have also proven to be a great aid to the workers' welfare. Being fully motorized, they have practically eliminated all manual lifting and moving. As a result, worker fatigue has been reduced and safety improved.

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THE CLEVELAND CRANE & ENGINEERING CO.
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CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

NEW PRODUCTS and equipment

struments, vacuum tubes, telephonic equipment, household appliances and electronic apparatus. Taylor-Winfield Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 12

Pipe Machine Chuck

. . . power grip type

Wrenchless, the chuck can be sized with a hand wheel. Tightening is done with machine power. When the power is turned on, roller grip jaws tighten themselves

according to need. The chuck can't lock, slip, crush pipe or tubing and will not mar soft materials.

Roller grip jaws are easily inserted without dismantling, replacement parts are quickly and easily installed. Beaver Pipe Tools Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 13

Nickel Plating

. . . fully bright deposits

This process produces fully-bright ductile white deposits with low stress. It is also characterized by stability of plating solution over long periods. Deposits require no activation prior to chromium plating.

Nickel-Lume Barrel Plating does not require continuous filtration. Plating can be carried on over a temperature range of 75 to 120°F without loss of brightness. Hanson-Van Winkle-Munning Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 14

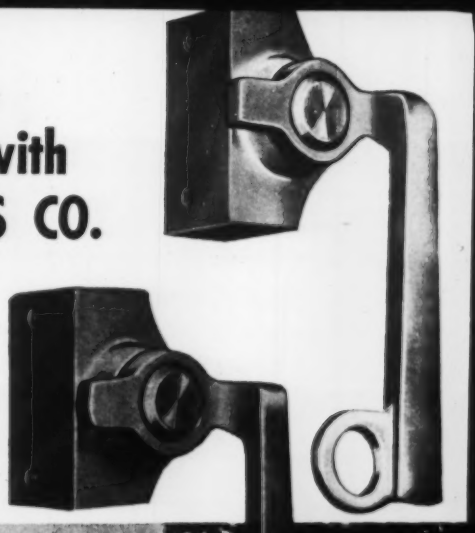
Hard-Facing Alloy

. . . chrome-cobalt-tungsten

It combines impact, corrosion and abrasion resistance. It does not readily heat-check under pressure at elevated temperatures, is virtually unaffected by most common corrosive chemicals and atmospheric conditions, resists chipping and spalling and has some ductility.

Walloy No. 6 comes as hard-facing rod for oxy-acetylene torch ap-

put real sales appeal in your products with MUELLER BRASS CO. forgings



Windows in this modern new Florida hospital supplied by Valley Metal Products Co.—subsidiary, Mueller Brass Co.

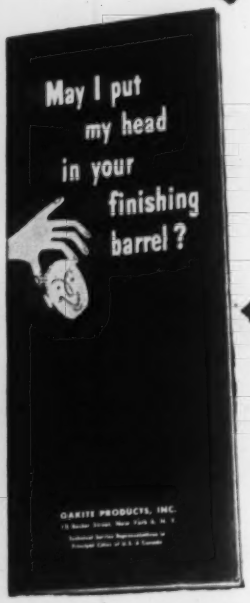
The aluminum hardware used on all the windows in this modern hospital is a good example of the sales appeal that can be built into a product with Mueller Brass Co. forgings. These forgings are smart in design, practical in operation, and low in cost. They can also be produced in natural bronze or chrome finish depending on the desires of the architect or builder.

All Mueller Brass Co. forgings have a dense, close-grained structure with a high tensile strength. Weight savings up to 40% are possible in the design of parts because of the close tolerances to which they can be produced. Less scrap and longer tool life result from the easy machinability of forged parts. Mueller Brass Co. is completely equipped to produce brass, bronze or aluminum forgings to your specifications. For complete details, write us today.

MUELLER BRASS CO.

PORT HURON 19, MICHIGAN

125



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THE MORE PROFIT
YOU TAKE OUT

Useful facts gathered during Oakite's years of experience in barrel finishing are packed like #12 stones in this 10-page booklet covering such subjects as:

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BURNISHING—Good solutions; Burnishing media, water and work ratios, etc.; How to overcome water hardness; How to keep barrels and media clean; How to prevent rusting, tarnishing and other corrosion.

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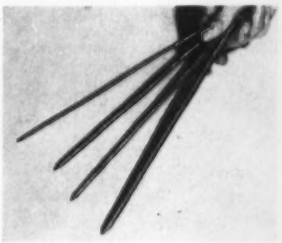
plication. It has been developed to provide a material that is suited to



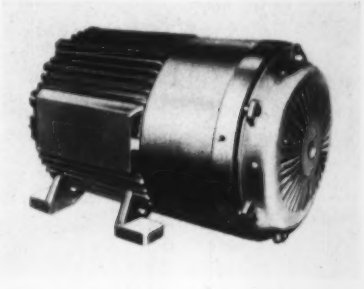
such applications as edger rolls, swaging mandrels, engine exhaust valves, etc. Wall Colmonoy Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 15

Thrust Brake Motors

. . . with integral brake

Built in a range of sizes from ¾ to 30 hp, both squirrel and slip



ring, the motors feature a built-in brake. The motors, in outside appearance resembling some other totally enclosed fan-cooled motors, are simple in construction and meet NEMA standards.

The rotating brake member also acts as an effective fan to air cool the motor. Brake release is fast. Harnischfeger Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 16

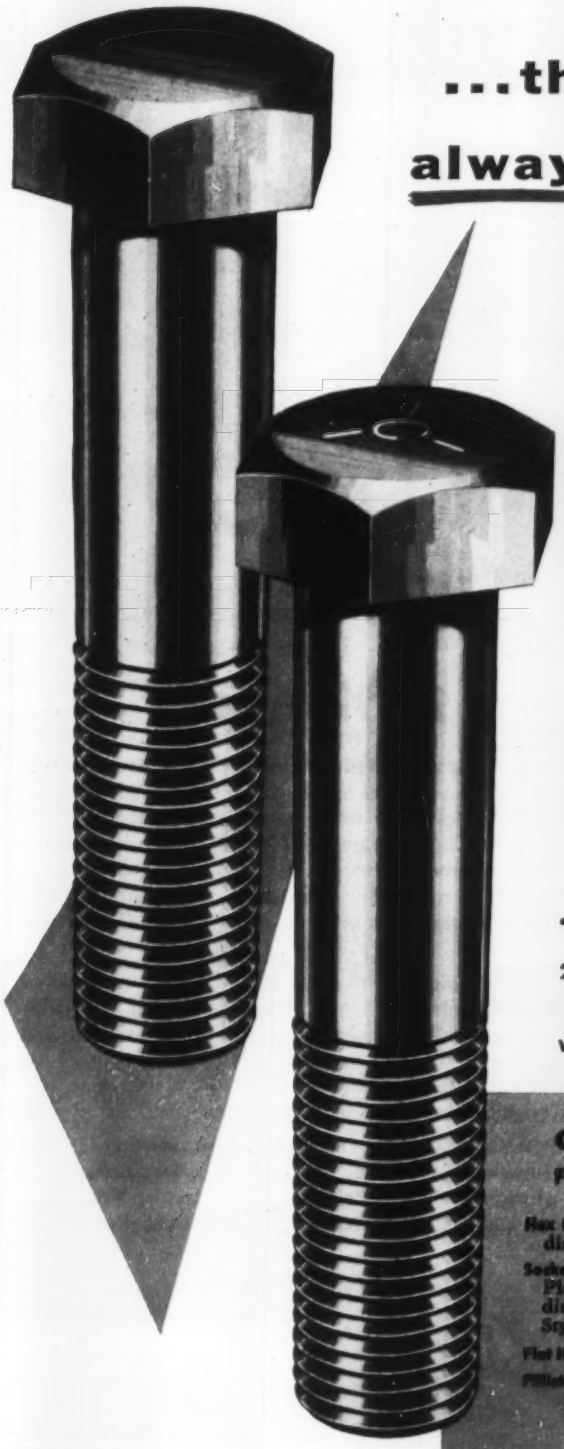
Testing Machine

. . . for high-production work

The machine (developed by the Riehle Testing Machines Division) is for determining how metal alloys will react during forming operations and at high temperatures. It can utilize electric furnaces producing temperatures to 1750°F and permits installation of multiple furnaces for production testing.

Screw-powered, the machine has positive control of testing speed and maintains a constant rate of

Which is the CleCap?



...the one that's always ready for you

We're never "out of stock" on any of the popular sizes in High Carbon Heat Treated Cap Screws—CleCap's pride and joy among tough dependable hex head screws.

One thing you'll soon learn when you deal with CleCap—as cap screw specialists, we haven't so many irons in the fire that we can't keep our production well balanced and maintain stocks to meet demands. And we make it a point to stock many sizes and lengths not commonly listed.

It's good business to use these extra tough 1038s. And it's good business to order them from the hustlers at CleCap—or from one of the many efficient CleCap distributors.

Approximate Tensile Strength*
(Lbs. per Sq. In. Minimum)

Stock screws are double heat treated to SAE Grade 5 physical properties

Up to ¾" dia. inclusive	120,000
Over ¾" to 1" dia. inclusive	115,000
Over 1" to 1½" dia. inclusive	105,000

**Based on mean thread area.*

The Cleveland Cap Screw Co.

2935 EAST 79th STREET • CLEVELAND 4, OHIO

VU Ican 3-3700 TWX CV42

Warehouses: Chicago • Philadelphia • New York • Providence • Los Angeles

CLEVELAND *Top Quality* FASTENERS

Ferrous and Non-Ferrous: Bright, High Carbon and Alloy Steel Heat Treated, Brass, Silicon Bronze, Stainless Steel

Hex Head Cap Screws—¼" to 2½" dia.

Socket Head Cap and Set Screws—Plain and Knurled: ¼" to 1½" dia. Also Flat and Button Head Styles

Flat Head Cap Screws—¼" to ½" dia.

Fillister Head—¼" to 1¼" dia.

Set Screws—Square Head—¼" to 1¼" dia.

Milled Studs—¼" to 1¼" dia.

Place Bolts—¼" to 1½" dia.

Structural Bolts to ASTM Specification A325

Tractor Bolts

Special Hot and Cold Headed Parts

Facilities to make larger diameters than listed

Ask Your Jobber for CleCap!

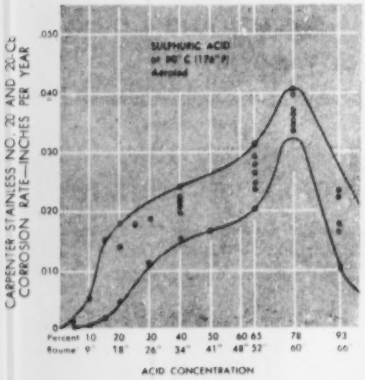
Originators of the Kaufman DOUBLE EXTRUSION Process

When will you add *yours* to the list?

How *sure* are you that your troublesome corrosion problems can't be licked? We've helped to solve a lot of "toughies", and we'd like to help you with yours. For example, one plant had a problem with Stainless Type 316 tie rods exposed to a solution of sulphuric acid ranging from 0% to 58%. Temperature: 158°F. (70°C.). After changing to Carpenter *Stainless No. 20*, life of the rods increased from 4 days to 256, and the *No. 20* rods still don't show any signs of corrosion. This is just one job report of many that shows what happens when plants change from ordinary stainless steels to Carpenter *Stainless No. 20*.

There is no other stainless on the market quite like *Stainless No. 20*. It was developed after seven years' research in Carpenter laboratories. It combines good workability with super resistance to many types of hard-to-handle acids (including sulphuric) at high operating temperatures. And in the short time it has been available, *No. 20* has added months, sometimes *years*, to the life of equipment such as mixing tanks, heat exchangers, process piping, pump and valve parts, bolts, nuts, tie rods, pickling racks, etc.

Here is your opportunity to realize *new* freedom from corrosion headaches. Tell your Carpenter representative you want to see the new No. 20 Comparative Corrosion Kit containing proof of super corrosion resistance. Or, to get started in testing No. 20 now, drop us a line for test coupons. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

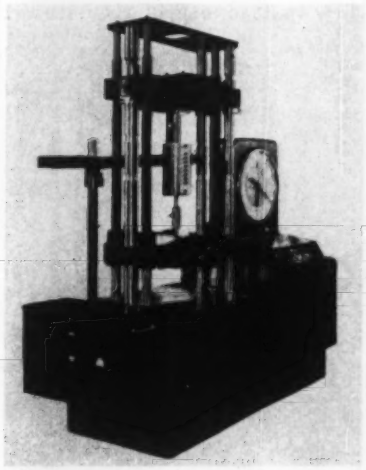


Carpenter Stainless No. 20-Cb is available from The Carpenter Steel Company, Alloy Tube Division, Union, New Jersey, in the forms of tubing, sheet, strip, pipe and plate; and Stainless No. 20 in the forms of bars, billets and wire. In addition, many other No. 20 fabricated parts are available from various manufacturers. Write us for their names.

Carpenter STEEL — **Stainless No. 20**

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research
Export Department: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

strain at any speed setting. Specimen diameters are 0.252 to



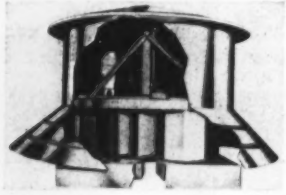
0.505 in. Riehle Testing Machines Division, American Machine & Metals Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 17

Power Roof Exhausters

. . . for quiet applications

Available with either direct or V-belt, the Type B, Gyra-Flo exhauster is designed for quiet operation. Air guide vanes stationed at



cut-off point account for high efficiency.

The specially designed discharge cone utilizes the spin of the air discharged off the peripheral edges of the wheel, which enters the atmosphere with minimum turbulence and discharge loss. Chicago Blower Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 18

Pallet Dispenser

. . . automatic

The dispenser and stacker have a raising and lowering mechanism, plus a magazine to hold a quantity of pallets. Design is simple and rugged, requiring minimum maintenance. The dispenser will handle

Bailey GOGGLE VALVES

For shutting off gas mains from 6" to 72" in diameter, these valves are the means to complete safety, complete dependability. Whether they are used every day or as infrequently as once a year, they open or close instantly. A tight, sure seal is provided by a clamping force applied equally at all points around the disc periphery. The same powerful mechanism frees the goggle plate.

If desired, Bailey Goggle Valves may be totally enclosed. Both types—open and enclosed—require only a minimum of maintenance.

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
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Select the OHIO Distributor near you FOR power transmission SERVICE

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Atlanta, Georgia
A. Halliday Co., Inc.
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A. Halliday Co., Inc.
***Buffalo, N. Y.**
*S. H. Pooley
Belting Co.
F. E. Allen Co.
***Chicago, Illinois**
Apex Power Equip. Co.
Schrade-Batterson Co.
***Cincinnati 14, Ohio**
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***Cleveland, Ohio**
J. A. Shomer Co.
Ohio Gear Co.
***Detroit 3, Michigan**
Abrasive & Supply
***Erie, Pa.**
Cohen Industrial
Supply
***Grand Rapids 2, Mich.**
F. Raniville Co.
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Houston 3, Texas
Behring's Bearing
Service, Inc.
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A. R. Young Co., Inc.
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& Gear Co.
***Louisville 2, Ky.**
Alfred Halliday
***Massillon, Ohio**
Hdwe. & Supply Co.
***Memphis 2, Tenn.**
Memphis Bearing &
Supply Co.
Milwaukee 11, Wisc.
Albert F. Korf Co.
***Minneapolis 4, Minn.**
Ind. Supply Co., Inc.
New Haven, Conn.
George G. Pragst
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***(Gears)** R. J.
Tricon Co., Inc.
***(Reducers)** Woodward
Wight & Co., Ltd.
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Transmission Co., Inc.
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Co., Inc.
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ESTABLISHED 1915
OHIO GEARS

OHIO GEAR CO. • 1359 E. 179th ST. • CLEVELAND 10, OHIO

a single empty pallet in any manner that is convenient.

Fork-trucks are used to load the dispenser, to unload the stacker.

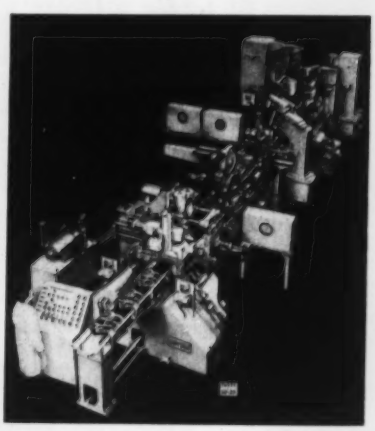
Pallets can be kept at a central pallet-storage area. The units, which are adaptable to automatic control, are portable. Beacon Machinery Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 19

Station Line Index

. . . 21 stations

This automatic cycle machine automatically tests parts for leak-



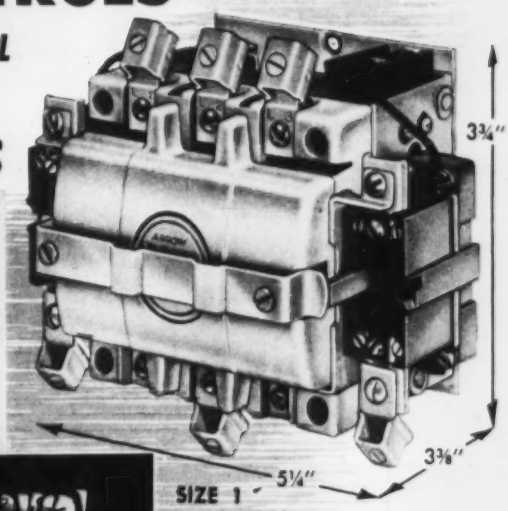
age and proper volume of air flow. If a part is faulty for improper air flow, it is marked by a solenoid operated punch, identifying it as a reject and indicating the reason.

The machine, which may be operated by unskilled help, is essentially a series of bases in line,

Radically Smaller

ADVANCED DESIGN MOTOR CONTROLS

HELP THIS NEW AIRFOIL MILLING MACHINE SMASH DEFENSE BOTTLENECKS



The Model 102 Airfoil Milling Machine, developed and manufactured by the New England Machine and Tool Company of Berlin, Conn., is sold exclusively through Pratt & Whitney Division Niles-Bement-Pond Co. of West Hartford, Conn.

Replacing previous hand methods, this ingenious new machine mills the original, 3-dimensional masters from which turbine blades for jet aircraft engines are manufactured. Reliably accurate masters . . . precision machined and faired to the designers' exact specifications . . . are now produced in *hours* where weeks of laborious bench work were once required. Another dangerous bottleneck in our vital defense effort is broken.

Complexity of the operating components in the Model 102 Milling Machine placed a premium on space . . . and space had to be found for 4 across-the-line starters and 1 reversing starter. Bulky controls of conventional design would necessitate a much larger control cabinet and interfere with the machine's easy accessibility from both sides necessary for set up purposes.

Space-saving Arrow-Hart Controls were easily fitted into the machine base. Lighter weight made it practical to mount all 5 starters on an unusually compact door-back panel (with plenty of space left for easy wiring) that swings out for instant accessibility. And these A-H Controls also assure the added benefits of superior performance, greater dependability and longer life.

***YOUR* ADVANCED DESIGN MACHINES . . . deserve electrical controls that will bring out the full efficiency that you have designed into them. Specify Arrow-Hart . . . you'll be years ahead.**

SEND NOW FOR COMPLETE INFORMATION ABOUT ARROW-HART ADVANCED DESIGN ▶

SINCE 1890

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INDUSTRIAL CONTROL DIVISION
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Offices, sales engineers and warehouses in: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Kansas City, Mo., Los Angeles, Milwaukee, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco. In Canada: Arrow-Hart & Hegeman (Canada) Ltd., Mt. Dennis, Toronto. In England: Arrow Electric Switches, Ltd., Ealing, London W 5.

QUALITY MOTOR CONTROLS • WIRING DEVICES
ENCLOSED SWITCHES • APPLIANCE SWITCHES

INDUSTRIAL CONTROL DIVISION
THE ARROW-HART & HEGEMAN ELECTRIC CO.
103 HAWTHORN STREET, HARTFORD 6, CONN.

☐ *Please send circular describing A-H Advanced Design Controls.*
☐ *Please send catalog covering the complete A-H Motor Control Line.*

NAME _____
POSITION _____
COMPANY _____
CO. ADDRESS _____
CITY _____ ZONE _____ STATE _____

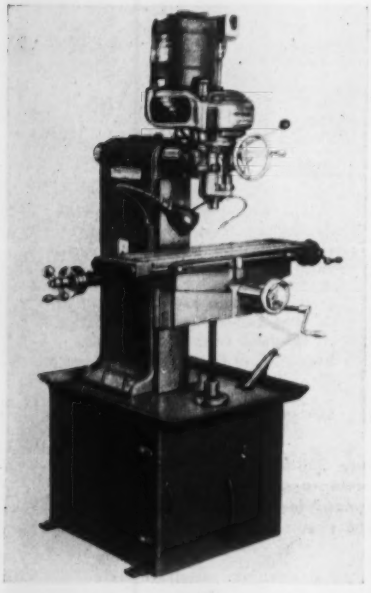
which support the fixture and line indexing mechanism. Operation is entirely automatic after loading (except at station 9 when there is a defect). The machine may be operated by unskilled help. Snyder Tool & Engineering Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 20

Vertical Milling Machine

. . . precision built attachment

This machine combines precision-built milling attachments and the superior accuracy of sturdy hand-scraped bearing surfaces for perfect alignment and smooth operation. Only tapered gibs are



used. It is available with the Crowningshield Attachment.

Heavy-walled castings with wide ways insure rigid support of working parts. The table is supported by an extra-large saddle bearing surface of 117 sq in. Crowningshield-Harris Co.

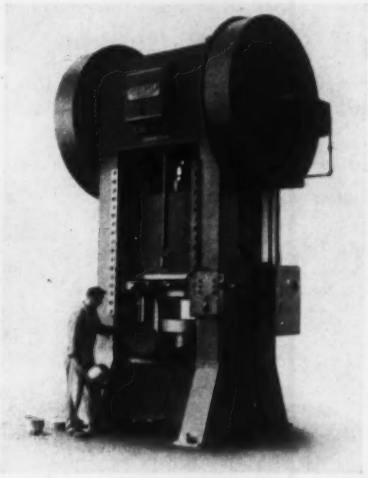
FOR MORE DATA CIRCLE REPLY CARD NO. 21

Deep-Draw Presses

. . . for high temperature work

The machines operate at high speeds during the nonproductive portion of the ram stroke, at a slower, correct speed while drawing.

The Steelweld, Hi-Draw presses come in single or double, one-two, or four-point types. Capacities range from 160 tons and up. Illustrated, is the 215-ton, single-point, single-action press with die



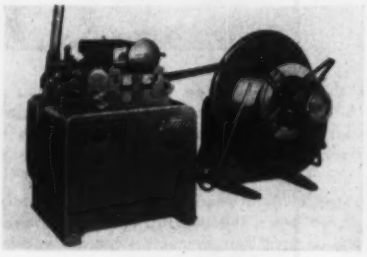
cushion. Parts being made take a 7-in. deep draw in one operation. Cleveland Crane & Engineering Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 22

Straightening Machine

. . . hydraulically driven

The machine quickly converts a manually operated punch press to automatic operation. The unit can be moved by fork truck from one



punch press to another.

The 418-HRP will handle stock up to 0.125 in. thick. Three sizes, with roll widths of 12½, 18½ and 24½ in., are available. A wide range of feeding speed selectivity properly synchronizes feeding and punching productions. F. J. Littell Machine Co. of Chicago.

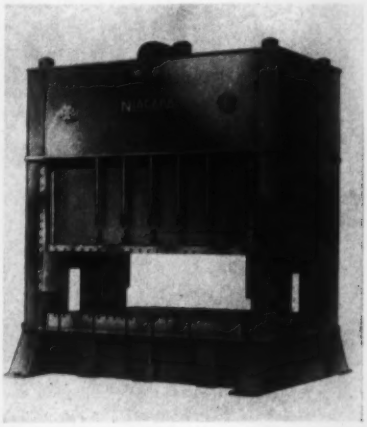
FOR MORE DATA CIRCLE REPLY CARD NO. 23

Eccentric Geared Presses

. . . for heavy tonnage work

The Series SE presses have been produced with one, two and four point suspension, covering a range of capacities of 100 through 1000 tons. A key feature is the crankless eccentric drive that delivers greater torque with less deflection.

Frames are of rugged, all steel, four piece, tie rod construction. The clutch is so designed that most



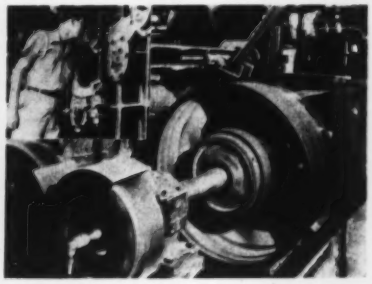
of its weight continues to rotate with the flywheel. The driving assembly is housed in the crown. Niagara Machine & Tool Works.

FOR MORE DATA CIRCLE REPLY CARD NO. 24

Air Clutch

. . . internal ventilation

The Air-Grip responds instantly to the touch of the throttle because a minimum of air is used in clutch operation. This sensitiv-



ity provides finger-tip control and an ability to inch the clutch or throw it into full engagement. Quick release valves built into the clutch allow instant disengagement. These valves are optional.

The flexible air seal disc is located so it does not come in contact with heat generating plates. A provision is made for mechanical engagement of the clutch if the air supply fails. Dodge Mfg. Corp.

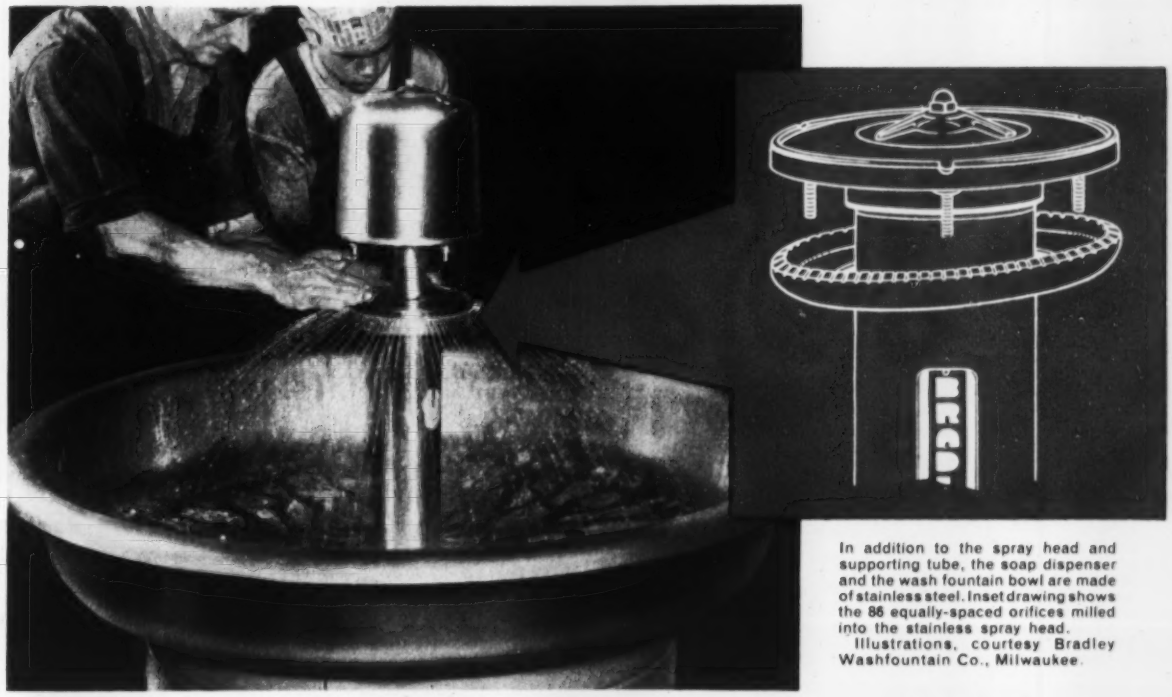
FOR MORE DATA CIRCLE REPLY CARD NO. 25

Grinding Segment Adhesive

. . . needs no heat

Gaff Bond 334 is applied to the surface of the stones. Segments

Better Job...Lower Cost



In addition to the spray head and supporting tube, the soap dispenser and the wash fountain bowl are made of stainless steel. Inset drawing shows the 86 equally-spaced orifices milled into the stainless spray head.
Illustrations, courtesy Bradley Washfountain Co., Milwaukee.

Again... CHICAGO STEEL SERVICE *Shows a Customer How Stainless Can Solve The Problem and Even Save Money*

THE PROBLEM This large manufacturer of group washfountains found that, under the continuous usage required of the equipment, the chromium plating on the cast brass spray head and sheet brass supporting tube showed excessive wear and that water scale clogged the orifices in the spray head, necessitating frequent cleaning.

THE SOLUTION Through the combined efforts of CSS metallurgists and the sales engineer servicing this account, exhaustive tests indicated that these parts could be made of stainless steel most advantageously. Today, the spray head is being formed from ⅛" stainless steel, and the spray head supporting tube is made of stainless sheet. As a result, there is no plating to wear off. The stainless parts are stronger, better able to stand up under hardest usage. The problem of water scale in the orifices has been minimized, reducing maintenance. And all of this has been accomplished *at lower, over-all cost.*

The House of Stainless

In the back of your mind, there may be questions concerning *your* production. The House of Stainless will welcome the opportunity to help you find the answers, as well as supply the stainless needed—from warehouse stocks or through mill shipments.

Phone LAfayette 3-7210 for your stainless or carbon steel needs.

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Milwaukee District Office: 757 North Broadway, Milwaukee 2, Wisc. • Telephone BRoadway 2-7874
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TODAY!

PLAN-GEAR PGT TRANSMISSION
• PATENT PENDING •

AS SIMPLE TO OPERATE AS AN ELECTRIC MOTOR

Anyone can easily operate the new **PGT compound planetary transmission** by merely moving a single hydraulic control lever. With two forward and one reverse speeds, instantaneous selection is possible because the cushion shift action of the **PGT** prevents shock loading. Shift is made from full speed forward to full speed reverse in only 1½ seconds.

CONTROLLED BY HYDRAULIC PRESSURE

The **Plan-Gear Transmission** has two planetary gear assemblies for low and reverse and a multiple disk clutch for direct drive. The planetaries are actuated when hydraulic pressure contracts a band around an anulus or drum to provide the desired movement. A built-in oil pump provides pressure for actuating controls, lubrication, and flow to the torque converter.

The simply designed, sturdily built **Plan-Gear Transmission** has been tested exhaustively and successfully in the field as well as in the laboratory, and has proved superior to other more complex transmissions. If you have need for a transmission with 150 pound-feet continuous input torque, we'd like to discuss the matter with you. Write today for further information.

PGT-150 PLAN-GEAR compound planetary transmission

is rated at 150 pound-feet continuous input torque; self-lubricated, constant duty, for use with torque converter. Standard ratios: high, 1:1; low, 3:1; reverse, 3.2:1; optional reverse, 2.23:1.

Suggested Uses:

- Front end loaders
- Lift trucks
- Earth movers
- Hoists and cranes
- Car pullers
- Slushers
- Machine tools
- Conveyors
- Power take-offs
- Truck mixers

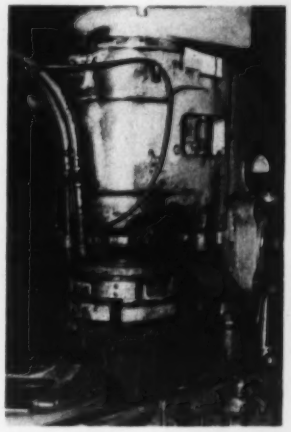
Designed and built exclusively by

AMERICAN GEAR & MFG. CO.

New Avenue, Lemont, Illinois
Phone: Lemont 920

Subsidiary of BRAD FOOTE GEAR WORKS, INC., Cicero 50, Illinois

are held together with two "C" clamps for 48 hours, then returned to grinder for re-use. No heat or pressure is required.



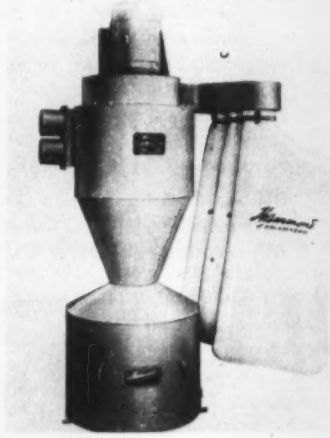
The cemented joint does not interfere with grinding. In a pull test, cement withstood 15,000 lb of pressure. Chemical Development Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 26

Cyclone Duskolector

. . . for exhaust outdoors

Model CYO-8 can also be exhausted into three self-contained dust collecting bags. It controls varied dust-producing operations



and will collect similar dust from multiple sources.

Specifications are: Motor, 5 hp, 2000 cfm; inlet diameter, one 8 or two 6 in.; outlet diameter 9 in.; dimensions 29 in. x 91 in.; net weight, 400 lb. Hammond Machinery Builders Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 27

FREE LITERATURE

Catalogs and Clip Sheets

Use these reply cards to bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Welding

Eutectic Welding Alloys Corp.'s "How to Overcome Your Welding Problems and Improve your Welding Techniques" is offered—8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 28

Manufacturing Activities

Blaw-Knox Co.'s diversified manufacturing activities are shown in "This is Blaw-Knox." Emphasis is on product, service and application —50 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 29

Cold Roll Forming

Caine Steel Co. offers a "Guide To Cold Roll Forming," which explains this advanced process—16 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 30

Steelmaking

Bethlehem Pacific Coast Steel Corp. describes the complete steelmaking process from ore to finished product in "Steel in the Making."

FOR A FREE COPY CIRCLE REPLY CARD NO. 31

Cast Irons

International Nickel Co. Inc. offers information on heat treatment fundamentals of nickel alloy cast irons—Bulletin A-115, 16 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 32

Recorders

Minneapolis - Honeywell Regulator Co.'s Instrumentation Data Sheet describes the Surface Combustion Corp.'s Dewpoint Recorder—10.5-1a.

FOR A FREE COPY CIRCLE REPLY CARD NO. 33

Roller Bearings

Rollway Bearing Co.'s catalog describes the Tru-Rol line of cylindrical roller bearings. Types, sizes, dimensions and load ratings are given—TR-854-DC.

FOR A FREE COPY CIRCLE REPLY CARD NO. 34

Forging

Consolidated Industries Inc.'s "Forging for Industry" covers facilities for meeting customer specifications of size, hardness, strength and delivery—19 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 35

Siding Sheet

Aluminum Co. of America offers information on their ribbed industrial siding sheet. Diagrams and specifications are included—File No. 12-C, Series 300-1.

FOR A FREE COPY CIRCLE REPLY CARD NO. 36

Casting Impregnation

American Metaseal Mfg. Corp. shows how a modern method achieves complete impregnation of porous castings. Application to several metals is covered — 8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 37

Bridge Cranes

Michigan Crane & Conveyor Corp. covers its line of overhead bridge cranes and gives general specifications and application data on each—6 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 38

Super Alloys

Universal-Cyclops Steel Corp. offers a brochure on Super Alloys, which are high strength heat and corrosion resistant materials—20 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 39

Installation Accessories

J. N. Fauver Co. Inc. has data on installation accessories for lubrication, hydraulic, steam, liquid and air applications—16 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 40

Gas Conversions

American Liquid Gas Corp.'s "New, Low Cost Load Power for Your Industrial Trucks" describes

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

ARTICLE OR ADVERTISEMENT — PAGE

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3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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LP-Gas conversions for industrial trucks—Form FL-100.

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Metal Quenching

Gulf Oil Corp. has prepared a booklet containing information on the quenching of metals. Case histories and solutions are included—24 pages.

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Generator Drives

Dana Corp. covers their positive generator drives, Model 2:2-1, for ½ to 5 kw generators on cabooses, mail cars, baggage cars, etc.—Bulletin 323, 32 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 43

Work Clothes

Worklon Inc. has issued a catalog on their orlon and dynel, acid- and caustic-resistant industrial apparel. A list of reduced prices is included—11 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 44

Caps, Filler Necks

Eaton Mfg. Co. gives engineering data on the standard line of Easy-On caps and related necks in stock for fluid tank installations—12 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 45

Precision Plug Gages

DeKalb Precision Industries describes plug and ring gages in detail—12 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 46

Coolant Pumps

Ingersoll-Rand Co. shows the entire line of Class KRV and KRVS Motorpumps. It is intended to aid in the selection of the proper pump for the job—Form 7074-D, 19 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO 47

Balancing Machines

Balance Engineering Co. describes their static and dynamic balancing machines, lists specifications and gives the theory of operation—7 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 48

Self-Balancing Indicator

Thermo Electric Co. Inc. has released a bulletin on the Thermo Electronic self-balancing indicator for reading or logging temperatures—Bulletin 61, 1 page.

FOR A FREE COPY CIRCLE REPLY CARD NO. 49

Products Catalog

Bernard Franklin Co. Inc. announces a catalog describing items added to their line of steel shelving, cabinets, bins, trucks, stools, etc.—Catalog H4, 16 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 50

Pilot Lights

Dialight Corp.'s "Selection and Application of Pilot Lights" gives design factors and requirements entering into the selection of these lights—8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 51

Buffs

American Buff Co. covers several new types of automatic buffs designed for special needs—12 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 52

Testing, Processing

Bowser Technical Refrigeration has issued a catalog covering its line of environmental testing and processing equipment—12 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 53

EDITORIAL REPRINTS

Companies For Sale

Buying or selling a company is pretty much an individual-case proposition, but there are some general patterns that can be followed to make the task easier. (p. 102).

FOR A FREE COPY CIRCLE REPLY CARD NO. 54

Leaded Steels

Here's the first article describing how lead is added to steel (p. 150). Following, on p. 159, you'll find application proof.

FOR A FREE COPY CIRCLE REPLY CARD NO. 55

On Making Money

Beginning on p. 133 is a nine-page roundup outlining today's pattern for profit. It covers machining, heat treating, finishing, casting, forming, joining, inspection, testing and handling.

FOR A FREE COPY CIRCLE REPLY CARD NO. 56

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

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COMPANY _____

PRODUCTS MANUFACTURED _____

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7	17	27	37	47	57	67	77	87
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STEEL
October 25, 1954

Market Outlook

NOW that the die is pretty well cast for this year's steel business, market analysts are flexing their slide rules toward 1955.

The estimate you hear most frequently for next year is an ingot production rate 75 per cent of capacity. That would yield 93 million tons of ingots. In only three other years (1950, 1951 and 1953) has the outturn been bigger.

HOW THEY FIGURE— A 75-per-cent rate indicates a belief that 1955's business will continue at the accelerated pace expected for the fourth quarter of 1954. This expected demand would come more from the end of steel inventory liquidation than from a pronounced upturn in business in general. All this year consumption of finished steel has exceeded steel production. If production had been up to consumption, ingot output would have been at annual rate of about 95 million net tons. That's about equal to 75 per cent of capacity.

REPETITION— The reason for the predicted rate is that consumption of finished products is expected to be fairly comparable to that in 1954. No big expansion in any steel consuming group is expected next year. There may be some variations from this year, but gains and losses are expected to pretty much offset each other.

BETTER BY 9 PER CENT—If the ingot rate averages 75 per cent next year, it would represent a rise of around 9 per cent over the expected average of 69 per cent this year. The 1954 rate would not be so low if 1953 had not set such a high record for steel output. Part of that record came from steel that was not used until this year.

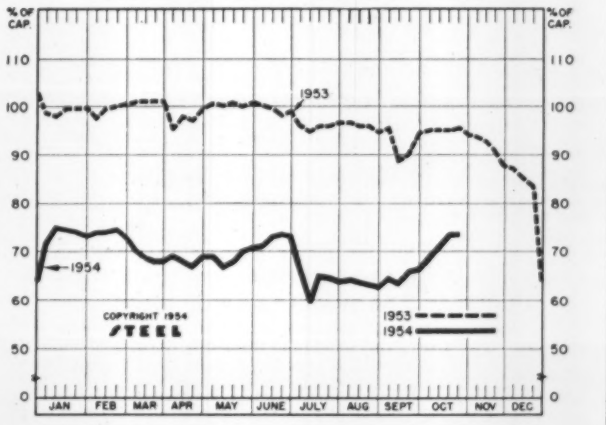
Currently, steel ingot output is off half a point, largely because of floods in the Ohio valley and a plant shutdown in the West for installation of new equipment. This put the national rate for the week ended Oct. 24 at 73 per cent of capacity.

STRONG POINT—Much of the recent new strength in steel demand is centered in cold-rolled carbon sheets, a product used extensively in automobiles. Cold-rolled sheets, however, are the largest product tonnagewise in the steel industry. Around 14 per cent of the industry's outturn of finished steel is in cold-rolled sheets. While some producers can deliver cold-rolled sheets in four to five weeks, others are sold out of this product for the rest of this year.

SEASONAL DIP— Seasonal effects are showing up in a reduced demand for tin plate and large structural shapes. Smaller shapes, and especially wide flanges, are holding up rather well in demand. Also lowering demand for tin plate was the price rise that became effective Oct. 1 on that product. Some customers increased their take in September to beat the price increase.

PRICE TRENDS— Steel prices are steady. This is reflected in STEEL's finished steel price composite, which holds at $117.95 a net ton. The scrap market, however, shows additional price strength, largely as a result of the improved rate of steel production and in export demand on the East Coast for scrap. STEEL's price composite on steelmaking grades of scrap rose to $32.33, a 33-cent increase over the preceding week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Oct. 24	Change	Same Week 1953	Same Week 1952
Pittsburgh	71	0*	97	106.5
Chicago	77.5	+ 1.5*	98	110.5
Mid-Atlantic	65	0	97	99
Youngstown	74	+ 2	104	105
Wheeling	82	— 5.5	98	96
Cleveland	82	+ 2*	100	112.5
Buffalo	70.5	0	106.5	95
Birmingham	74	0	96.5	106
New England	58	— 1	85	91
Cincinnati	70	+ 4.5	80.5	90
St. Louis	69.5	— 7	95.5	110
Detroit	82	+ 2*	100.5	106
Western	60	—28	100	103
National Rate	73	— 0.5	95.5	105.5

INGOT PRODUCTION‡

	Week Ended Oct. 24	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	109.3†	108.0	101.9	133.3
NET TONS (In thousands)	1,755†	1,735	1,637	2,142

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

Metalworking Outlook—p. 83

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Oct. 19 1954	Oct. 12 1954	Month Ago	Sept. Average
(1947-1949=100)	144.7	144.7	144.6	144.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Oct. 19

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.525	Sheets, electrical	$9.350
Rails, light, 40 lb	5.917	Strip, C.R., carbon	7.507
Tie Plates	5.275	Strip, C.R., stainless, 430 (lb)	0.415
Axles, railway	7.500	Strip, H.R., carbon	5.125
Wheels, freight car, 33 in. (per wheel)	48.500	Pipe, black, buttweld (100 ft)	15.000
Plates, carbon	4.675	Pipe, galv., buttweld (100 ft)	18.605
Structural Shapes	4.517	Pipe, line (100 ft)	146.804
Bars, tool steel, carbon (lb)	0.430	Casing, oil well, carbon (100 ft)	154.216
Bars, tool steel, alloy, oil hardening die (lb)	0.525	Casing, oil well, alloy (100 ft)	227.875
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Tubes, boiler (100 ft)	‡
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610	Tubing, mechanical, carbon	‡
Bars, H.R., alloy	8.775	Tubing, mechanical, stainless, 304 (100 ft)	161.193
Bars, H.R., stainless, 303 (lb)	0.418	Tin plate, hot-dipped, 1.25 lb	8.533
Bars, H.R., carbon	5.000	Tin plate, electrolytic, 0.25 lb	7.233
Bars, reinforcing	5.050	Black plate, can making quality	6.333
Bars, C.F., carbon	8.160	Wire, drawn, carbon	7.938
Bars, C.F., alloy	11.275	Wire, drawn, stainless, 430 (lb)	0.545
Bars, C.F., stainless, 302 (lb)	0.433	Bale ties (bundle)	5.860
Sheets, H.R., carbon	4.880	Nails, wire, 8d common	7.815
Sheets, C.R., carbon	5.871	Wire, barbed (80-rod spool)	7.109
Sheets, galvanized	7.220	Woven wire fence (20-rod roll)	16.815
Sheets, C.R., stainless, 302 (lb)	0.548		

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Oct. 20 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	194.53	194.53	194.19	189.38	152.52
Index in cents per lb.	5.270	5.270	5.261	5.130	4.132

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.95	$117.95	$117.77	$115.41	$91.64
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.10
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.60
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	32.33	32.00	29.75	32.83	26.17

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Oct. 20 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.35
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.35
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	5.302	3.83
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	3.95-4.00
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.25
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.25
Shapes, deld., Philadelphia	4.53	4.53	4.53	4.38	3.50
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.40
Plates, Chicago	4.225	4.225	4.225	4.10	3.40
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.35	3.50
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.40
Plates, Claymont, Del.	4.225	4.225	4.225	4.55	3.50
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.25
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.025	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45-5.95	4.00
Strip, C.R., Chicago	6.00	6.00	6.00	5.70	4.00-4.15
Strip, C.R., Detroit	5.60-.90	5.60-.90	5.60-.90	5.45-6.05	4.20-.25
Wire, Basic, Pitts.	5.75	5.75	5.75	5.475-5.525	4.15
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.35-6.55	5.15
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$8.95	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$61.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	4.675	4.675	4.675	4.525	3.40
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	49.66	60.75	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	50.16	50.16	50.16	61.25	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	39.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.62	60.43	46.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$32.50	$32.50	$30.50	$36.50	$29.00
No. 1 Heavy melt, E. Pa.	31.50	30.50	28.75	31.50	24.00
No. 1 Heavy Melt, Chicago	33.00	33.00	30.00	30.50	25.50
No. 1 Heavy Melt, Valley	35.00	35.00	32.50	34.50	31.25
No. 1 Heavy Melt, Cleve.	32.00	32.00	30.50	31.50	26.50
No. 1 Heavy Melt, Buffalo	30.50	30.50	28.50	34.50	28.25
Rails, Rerolling, Chicago	56.00	52.50	47.50	42.50	41.50
No. 1 Cast, Chicago	39.50	39.50	35.50	32.50	41.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$13.75	$14.75	$14.75	$14.75	$13.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	16.75	15.75
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

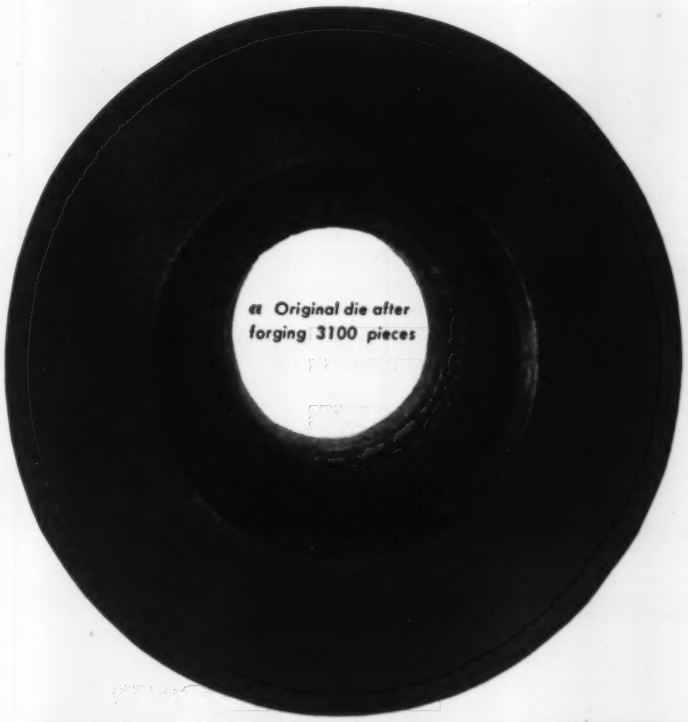
Daily Nonferrous Price Record

	Price Oct. 20	Last Change	Previous Price	Sept. Avg.	Aug. Avg.	Oct. 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	30.000	30.000	29.606
Lead	14.80	Oct. 4	14.55	14.400	13.846	13.300
Zinc	11.50	Sept. 3	11.00	11.900	11.000	10.000
Tin	92.875	Oct. 20	93.000	93.545	93.332	81.096
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	22.20	Aug. 5, 1954	21.50	22.200	22.119	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, commond grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+ %, deld.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**



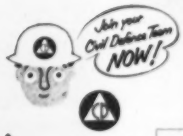
CRUCIBLE REXWELD hard surfacing rods increased forging die life OVER 400%

for R. G. LeTourneau, Inc.

By Rexwelding, R. G. LeTourneau, Inc., Longview, Texas, increased the life of its production dies over 400%. The dies shown, for example, used to forge a plug adapter of SAE 1030 steel at 2350 F, had to be removed from the press after forging 3100 pieces because of excessive wear and heat checking. The same die, after worn areas were machined out and faces built up with Rexweld-A hard surfacing rod, produced 9300 pieces.

You can do the same in your shop. You'll find that Rexwelded dies have higher edge strength at elevated temperatures, and resist chipping, deformation and heat checking better. And parts can be Rexwelded over and over.

So, use Rexweld Rods on your next hard surfacing application. They are available in both bare rods and low hydrogen coated electrodes, in a wide range of grades and sizes. Call your local Crucible representative — he can provide a grade of Rexweld adapted to your specific job.



CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking

REXWELD HARD SURFACING ROD

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MAX-EL • SPECIAL PURPOSE STEELS

Nonferrous Metals

If you're on the verge of closing down for want of copper, you can ask for government help in getting supplies of the red metal. Here's how to go about it

Nonferrous Metal Prices, Pages 240 & 241

YOU won't have to close your plant for lack of copper—but you'll have to be on the verge of it to get government help.

In making 26,500 tons of government-controlled red metal available to industry for October use, the Business & Defense Services Administration will limit distribution to "companies facing shutdowns for lack of the metal."

How To Do It—Requests for allocation should be submitted to BDSA's Copper Division, Washington 25. Use form BDSAF-271 which requires certification of the additional amounts needed to meet October order board or to bring consumption to the August, 1954, level, whichever is lower. Most of the material is in the form of wire bars and shapes. Distribution of 17,500 tons of copper released from Defense Material Production Administration inventory, not the stockpile, will be handled that way.

Another 9000 tons will come from authorization to copper producers to divert metal under contract for delivery to the strategic stockpile. Distribution of this tonnage will be made by General Services Administration on advice of BDSA. Producers must repay this borrowed copper to the stockpile by mid-1955. First deliveries were reported last week.

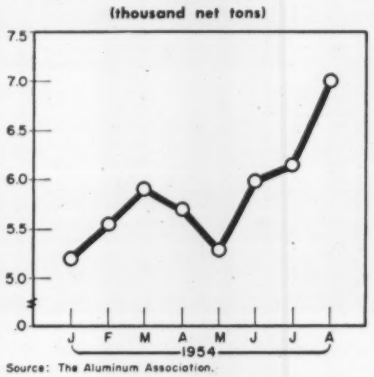
Scrap Curbs—In a related move to give consumers more metal, curbs were placed on exports of refined copper and copper-base scrap. Applicants for export license in the fourth quarter must certify that the copper they plan to ship is available immediately and is destined for an actual user, who must be named. Nonproducers must certify to ownership or commitment to deliver the materials for export by a specified date. Licenses are valid for two months only. Restrictions don't apply to copper materials brought into this country for processing and reexport.

Reason for these actions is the recently ended wave of strikes in mines and smelters. Their effect is shown graphically in September statistics from the Copper Institute. U. S. production skidded sharply to 87,623 tons and deliveries to fabricators continued downhill to 88,947 tons. Producers' stocks of 47,666 tons going into October were lowest in four years.

Endless Expansion

Potlines at Aluminum Co. of Canada's new Kitimat, B. C., aluminum smelter were hardly at full heat from their opening (STEEL, Aug. 9, p. 134) before the company announced further expansion. Work is under way to increase capacity by 60,000 tons to a total annual rating of 151,500 tons. The latest move is another step in Alcan's dream of building 550,000 tons of primary capacity at Kitimat. Cost of the new expansion, $45 million, to be spent in 1955 and 1956, is but a fraction of the initial Kitimat expenditure.

Aluminum Foil—
A New Record For Shipments



Source: The Aluminum Association.

Evolution in Stockpiling

Is stockpiling activity getting out of hand? It certainly has changed its character in the years since it began operating. Today, there are actually three stockpiles. The minimum program stockpile covers 76 materials, valued at a $7-billion goal. About 80 per cent of it is accomplished or ordered. Only 14 goals are not yet halfway achieved; 36 have been reached. The long-term stockpile was designed to lay away materials from overseas in case of war. It's being used primarily to buy domestic antimony, lead, zinc and manganese. Barter deals and floor-price contracts also come under this program. Third is the supplemental stockpile under which materials from abroad are exchanged for farm surplus materials and doesn't take into account requirements of either of the first two programs.

A Broad Approach

Selling die castings will sell more zinc. That philosophy is guiding American Zinc Institute's venture in promoting use of all kinds of die castings. In a film entitled, "Die Casting—How Else Would You Make It?" for which the institute picked up the tab, all die casting metals are given attention. Since more zinc is used in die casting than any other metal, zinc men believe they'll benefit naturally by building the process rather than the metal.

Market Memos

- In the Bureau of Labor Statistic's monthly wholesale price index all classes of nonferrous metals (except wire and cable) climbed sharply in September. Greatest gain was in scrap and secondary metal and alloy shapes, with lesser rises in mill shapes and primary metal refinery shapes. Nonferrous metals index in September stood at 126.1 per cent of the 1947-1949 average.

- Porcelain enameled aluminum is getting a close look by Alcoa researchers. Applied readily by standard enameling and firing procedures, porcelain enameled aluminum can be sawed and drilled without damage to the coating and resists chipping or spalling from impact or distortion of the base metal. The industry estimates the material will have a potential annual market of 200 million lb by 1970.

- Brass mill products distributors report booming business with mill strikes, copper shortages and pickup in production tempo. Backlog of orders in base metals is best in a year and a half, claims an eastern distributor.

- Commercially pure titanium foil as thin as 0.0005-in. in widths from 3/32 to 7¾ in. is supplied by American Silver Co. Chief applications are in aircraft, chemical, electrical and electronic industries.

- September primary aluminum production slipped to 12 033 tons, but third-quarter output set a record, reports The Aluminum Association.

every grade of ZINC

for urgent military and

civilian requirements

SLAB ZINC

PRIME WESTERN

SELECT

BRASS SPECIAL

INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

Metals Nonferrous

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 22.20, pigs 20.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 24; No. 43, 5% Si, 23.8; No. 142, 4% Cu, 25.1; No. 195, 4.5% Cu, 0.8% Si, 24.5; No. 214, 3.8% Mg, 25.2; No. 356, 7% Si, 0.3% Mg, 23.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 deld. Conn. Valley, 30.00 deld. Midwest; Lake 30.00 deld.; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $320-$325-$330, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 92.875.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $4.72; grade A-2 (0.5% Fe max) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb, f.o.b. shipping point; less than 1000 lb $5.10 99+% hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.85, special high grade 13.00, die casting alloy ingot 16.50, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 21.25-21.75; No. 12 foundry alloy (No. 2 grade) 20.25-20.75; 5% silicon alloy, 0.60 Cu max., 23.75-24.00; 13 alloy, 0.60 Cu max., 23.75-24.00; 195 alloy 21.75-22.75; 108 alloy 20.75-21.25; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.50-22.00; grade 2, 20.50-21.00; grade 3, 19.50-20.00; grade 4, 18.50-19.00.

Brass Ingot: Red brass, No. 115, 29.50; tin bronze No. 225, 41.00; No. 245, 34.75; high-leaded tin bronze, No. 305, 34.00; No. 1 yellow, No. 405, 25.25; manganese bronze No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy.) Strip, $1.68; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb. 36.53; l.c.l. 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $20.00 per cwt; pipe, full coils $20.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $6; hot-rolled and forged bars, $6.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM*

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	62.5	61.0	...	...
0.156-0.172	52.9	51.3	...	...
0.188	52.9	51.3	...	65.8
0.219-0.234	50.1	48.5	...	...
0.250-0.281	50.1	48.5	...	62.7
0.313	50.1	48.5	...	59.8
Cold-finished				
0.375-0.547	48.9	46.5	58.8	56.2
0.563-0.688	48.9	46.5	55.9	52.7
0.750-1.000	47.7	45.3	51.1	49.6
1.063	47.7	45.3	...	47.9
1.125-1.500	45.9	43.6	49.4	47.9
Rolled				
1.563	44.7	42.4	...	...
1.625-2.000	44.1	41.8	...	46.2
2.125-2.500	43.0	40.7	...	...
2.563-3.375	41.7	39.5	...	...

ALUMINUM*

Sheets and Circles: 1100 and 3003 mill finish c.l. (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	34.9	...	...
0.135-0.096	12-48	35.4	...	...
0.095-0.077	12-48	36.1	33.6	38.6
0.076-0.061	12-48	36.7	33.8	38.8
0.060-0.048	12-48	37.2	34.1	39.2
0.047-0.038	12-48	37.7	34.6	39.6
0.037-0.030	12-48	38.1	35.0	40.3
0.029-0.024	12-48	38.7	35.3	40.8
0.023-0.019	12-36	39.4	36.1	41.6
0.018-0.017	12-36	40.2	36.7	42.5
0.016-0.015	12-36	41.1	37.5	43.7
0.014	12-24	42.1	38.5	45.0
0.013-0.012	12-24	43.3	39.2	46.0
0.011	12-24	44.3	40.4	47.6
0.010-0.0095	12-24	45.5	41.5	49.2
0.009-0.0085	12-24	46.8	43.0	51.3
0.008-0.0075	12-24	48.4	44.2	53.1
0.007	12-18	49.9	45.7	55.4
0.006	12-18	51.5	47.1	60.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM*

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.7	38.9
5050-F	34.7	38.9
3004-F	35.7	40.6
5052-F	37.4	42.4
6061-T6	38.6	43.0
2024-T4*	40.8	46.9
7075-T6*	48.6	55.2

*24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM*

Forging Stock: Round, Class 1, 46.8-36.3, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 52.6-40 in. random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.70	2	$ 48.30
1	24.75	4	132.90
1¼	23.50	6	238.35
1½	40.05	8	358.60

*Alloy designations are standard for use on and after Oct. 1, 1954. To relate them to designations used prior to that time, see STEEL, Aug. 9, 1954, p. 95.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in., 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 28 clippings 14.00; low copper clippings 14.00; mixed clippings 12.00; old sheet 11.00; borings and turnings 7.00; pistons and struts 8.50; crankcases 11.00; industrial castings 11.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	34.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	59.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Munts Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire, No. 1 25.00; No. 2 copper 24.00; light copper 22.00; No. 1 composition red brass 20.00; No. 1 composition turnings 19.50; mixed brass turnings 14.00; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 12.50; heavy yellow brass 15.50; new brass rod ends 16.00; auto radiators, unsweated 17.00; cocks and faucets 17.00; brass pipe 17.50.

Lead: Heavy 11.75-12.00; battery plate 6.25-6.50; linotype and stereotype 13.75-14.00; electrotype 12.00-12.50; mixed babbitt 12.50-13.00.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 5.00-5.25; new die cast scrap, 4.75-5.00; old die cast scrap, 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 16.00-16.25; 51S, 52S clippings 16.00-16.25; 14S, 17S, 24S clippings 15.25-15.50; mixed clipping 14.75-15.00; old sheet 14.00-14.25; old cast 14.00-14.25; clean old cable, free of steel 16.00-16.25; borings and turnings 14.25-14.75.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 27.25; No. 2 copper 25.75; light copper 24.25; refinery brass (60% copper) per dry copper content 24.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 27.25; No. 2 copper 25.75; light copper 24.25; No. 1 composition borings 22.50; No. 1 composition solids 22.75; heavy yellow brass solids 17.75; yellow brass turnings 16.75; radiators 18.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.115; 200-499 lb $1.10; 500-999 lb $1.095; 1000 lb or more $1.09.

Zinc: Bar 18.50, bar or flat top 17.50 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb. in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 71; 100-600 lb 56.7; 700-1900 lb 54.3; 2000-9900 lb 52.5; 10,000 lb or more 51.4.

Stannous Chloride: (Anhydrous): Less than 50 lb $1.57; 50 lb $1.23; 100-300 lb $1.08; 400-900 lb $1.055; 100-1900 lb $1.031; 2000-4900 lb 99.4; 5000-19,000 lb 99.3; 20,000 lb and over 87.2.

Stannous Sulphate: Less than 5 lb $1.269; 50 lb 96.9; 100-1900 lb 94.9; 2000 lb and over 92.9.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

LOOK TO DETREX FOR Service WITH A Saving

DETREX — rich in years of experience — coordinates Engineering and Chemistry for you . . .

The other day, a metal part came into the Detrex laboratory from one of our field offices. Along with complete information as to its function, the following notation was added, "Please examine the soil and make recommendations on how to clean it."

Detrex engineers and chemists quickly got together. Coordinating their activities, they analyzed the soil, examined the shape, considered the operations preceding and following cleaning, and all other factors. Result: a swift, sure answer to the customer's needs.

Not every query is as complex . . . previous experience on similar problems often provides an immediate solution. But most important is the fact that Detrex will not recommend a cleaning process unless they are positive it is going to work!

Detrex equipment specialists design and build the degreasers, washers, and processing machines. Detrex chemical specialists blend and manufacture the solvents and compounds. The final result of this unique coordination of effort and skill is top product quality—guaranteed results. What more could you ask?

Please have a Detrex field technician come in to discuss our metal cleaning operations and prove how Detrex can cut our costs and improve our quality.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

DETREX CORPORATION

DEPT. E-101, BOX 501, DETROIT 32, MICH.

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 243. Key to footnotes, page 245.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)

Detroit R7 .....$65.00
Houston S5 .....73.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 .....$64.00
Bessemer,Pa. U5 .....64.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Ensley,Ala. T2 .....64.00
Fairfield,Ala. T2 .....64.00
Fontana,Calif. K1 .....72.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 .....64.00
Lackawanna,N.Y. B2 ..64.00
Munhall,Pa. U5 .....64.00
So.Chicago,Ill. R2,U5 ..64.00
So.Duquesne,Pa. U5 ...64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 .....$78.00
Bessemer,Pa. U5 .....78.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 .....78.00
Fairfield,Ala. T2 .....78.00
Fontana,Calif. K1 .....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 .....78.00
Houston S5 .....85.00
Johnstown,Pa. B2 .....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 .....87.50
Munhall,Pa. U5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14..78.00
So.Duquesne,Pa. U5 ...78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 ....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 .....86.00
Houston S5 .....93.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 .....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago R2,U5,W14..86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O. Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R2 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP

Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 .....4.775
Munhall,Pa. U5 .....3.90
Warren,O. R2 .....3.90
Youngstown R2, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 ....5.475
Houston S5 .....5.075
IndianaHarbor,Ind Y1.4.675
Johnstown,Pa. B2 .....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. S5 ....5.015
Kokomo,Ind. C16 .....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ..5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 .....4.775
So.Chicago,Ill. R2 .....4.675
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
SparrowsPoint,Md. B2..4.775
Torrance,Calif. C11 ...5.475
Worcester,Mass. A7 ...4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 .....4.25
Aliquippa,Pa. J5 .....4.25
Bessemer,Ala. T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 .....4.90
Gary,Ind. U5 .....4.25
Geneva,Utah C11 .....4.25
Houston S5 .....4.65
Ind.Harbor,Ind. I-2 ...4.25
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....3.95
Portland,Oreg. O4 .....5.00
Seattle B3 .....5.00
So.Chicago U5, W14....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 .....4.25

Wide Flange

Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 .....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 ....3.95
So.Chicago,Ill. U5 .....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston S5 .....5.60
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 .....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah C11 .....6.40
Houston S5 .....6.80
Ind.Harbor,Ind. I-2, Y1.6.40
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 ....7.00
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14..6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ..6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 .....6.40

PILING

BEARING PILES

Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2....5.075
Lackawanna,N.Y. B2 ..5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill. U5 .....5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.225
Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 .....4.225
Buffalo R2 .....4.225
Clairton,Pa. U5 .....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 .....4.225
Coatesville,Pa. L7 ....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.375
Fairfield,Ala. T2 .....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 .....4.225
Geneva,Utah C11 .....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....3.975
Houston S5 .....4.625
Ind.Harbor,Ind. I-2, Y1.4.225
Johnstown,Pa. B2 .....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar,Tex. L6 .....4.55
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....5.125
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. R2 .....4.225
So.Chicago,Ill. U5,W14..4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O. R2 .....4.225
Weirton,W.Va. W6 ....4.225
Youngstown R2, U5, Y1 4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 .....6.025
Geneva,Utah C11 .....5.375

PLATES, Wrought Iron

Economy,Pa. B14 .....9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 .....6.45
Conshohocken,Pa. A3 ...6.45
Ecorse,Mich. G5 .....6.60
Fairfield,Ala. T2 .....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston S5 .....6.85
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14.6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy

Claymont,Del. C22 ....5.80
Coatesville,Pa. L7 ....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Houston S5 .....6.20
Johnstown,Pa. B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14.5.80
SparrowsPoint,Md. B2 ..5.80

FLOOR PLATES

Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ...5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 .....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 .....4.825

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala. R2 .....4.30
Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....4.30
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.40
Clairton,Pa. U5 .....4.30
Cleveland R2 .....4.30
Ecorse,Mich. G5 .....4.45
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
Fairless,Pa. U5 .....4.45
Fontana,Calif. K1 .....5.00
Gary,Ind. U5 .....4.30
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.00
Massillon,O. R2 .....4.40
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23....5.05
So.Chicago, R2 U5, W14 4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 .....4.30
Weirton,W.Va. W6 .....4.30
Youngstown R2, U5.....4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....5.075
Buffalo R2 .....5.075
Canton,O. R2, T7 .....5.075
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.075
Ecorse,Mich. G5 .....5.225
Fontana,Calif. K1 .....6.125
Fairless,Pa. U5 .....5.225
Gary,Ind. U5 .....5.075
Houston S5 .....5.475
Ind.Harbor,Ind. I-2, Y1.5.075
Johnstown,Pa. B2 .....5.075
KansasCity,Mo. S5 .....5.675
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....6.125
Massillon,O. R2 .....5.075
Midland,Pa. C18 .....5.075
So.Chicago R2, U5, W14 5.075
So.Duquesne,Pa. U5 ....5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5.....5.075

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland R2 .....6.45
Ecorse,Mich. G5 .....6.60
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston S5 .....6.85
Ind.Harb.,Ind. I-2, Y1..6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....7.05
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O. R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S_3 Shapes

Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....4.85
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston S5 .....5.60
KansasCity S5 .....5.80
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12, R2 5.40
Camden,N.J. P13 .....5.85
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 .....5.40
Detroit R7 .....5.40
Detroit B5, P17 .....5.60
Donora,Pa. A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ...5.40
Gary,Ind. R2 .....5.40
GreenBay,Wis. F7 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.90
Harvey,Ill. B5 .....5.40
LosAngeles R2, S30 ...6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2 R8 ....5.40
Monaca,Pa. S17 .....6.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 ....5.65
Putnam,Conn. W18 ....5.95
Readville,Mass. C14 ....5.95
St.Louis,Mo. M5 .....5.70
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Alloy (Turned and Ground)

Cumberland,Md.(5) C19.4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12, R2 6.625
Bethlehem,Pa. B2 .....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 .....6.625
Detroit R7 .....6.625
Detroit B5, P17 .....6.825
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind. R2 .....6.625
GreenBay,Wis. F7 .....6.625
Hammond,Ind. L2, M13 6.625
Hartford,Conn. R2 .....6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2..6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ...6.925
Massillon,O. R2, R8 ...6.625
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 ....6.825
So.Chicago W14 .....6.625
SpringCity,Pa. K3 .....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ...6.925
Youngstown F3, Y1 ....6.625

BARS, Reinforcing (fabricators)

Ala.City,Ala. R2 .....4.30
Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Cleveland R2 .....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
Fairless,Pa. U5 .....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 .....4.30
Houston S5 .....4.70

Ind.Harbor,Ind. I-2, Y1 4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SandSprings,Okla. S5 ..5.15
Seattle B3, N14,. P23...5.05
So.Chicago R2 .....4.30
So.Duquesne,Pa. U5 ...4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing (Fabricated; to consumers)

Johnstown,Pa., ¼-1" B2.5.70
KansasCity S5 .....6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Seattle B3, N14, P23 ..6.15
So.SanFrancisco B3 ....6.00
SparrowsPt. ½-1" B2..5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2.4.20
ChicagoHts.(4) C2, I-2.4.30
Ft.Worth,Tex(26) T4 ..4.75
Franklin,Pa. (3) F5 ..4.20
Franklin,Pa. (4) F5 ..4.30
Marion,O.(3) P11 .....4.15
Moline,Ill.(3) R2 .....4.30
Tonawanda(3) B12 .....4.15
Tonawanda(4) B12 .....4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks.(S.R.) L5 ..10.85
McK.Rks.(D.R.) L5 ..14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)

Ala.City,Ala. R2 .....4.05
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ....4.05
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ..4.10
Detroit(8) M1 .....4.20
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.05
Fairless,Pa. U5 .....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Geneva,Utah C11 .....4.15
GraniteCity,Ill. G4 ....4.25
Houston S5 .....4.45
Ind.Harbor,Ind. I-2, Y1.4.05
Irvin,Pa. U5 .....4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ..4.05
Mansfield,O. E6 (37) ...4.05
Mansfield,O. E6 (38) ...4.80
Munhall,Pa. U5 .....4.05
Newport,Ky. N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.06
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 ga. lighter)

Ala.City,Ala. R2 .....5.35
Kokomo,Ind. C16 .....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.25
Fairfield,Ala. T2 .....6.10
Fairless,Pa. U5 .....6.15
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1.6.10
Irvin,Pa. U5 .....6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 .....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....4.95
Fairless,Pa. U5 .....5.00
Follansbee,W.Va. F4 ...4.95
Fontana,Calif. K1 .....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 ....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Irvin,Pa. U5 .....4.95
Lackawanna,N.Y. B2 ..4.95
Middletown,O. A10 ....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 .....4.95
SparrowsPoint,Md. B2 ..4.95
Steubenville,O. W10 ....4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 .....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Ecorse,Mich. G5 .....7.65
Fairless,Pa. U5 .....7.55
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.50
IndianaHarbor,Ind. Y1...7.50
Irvin,Pa. U5 .....7.50
Lackawanna(37) B2 ...7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 .....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.55
Middletown,O. A10 .....5.45
Warren,O. R2 .....5.55

SHEETS, Culvert (16 Ga.)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind.Harbor I-2	6.25	6.50
Irvin, Pa. U5	5.70	....
Kokomo,Ind. C16	6.35	....
MartinsFry.,O. W10	6.25	....
Newport,Ky. N9	6.25	6.50
Pitts.,Calif. C11	6.45	....
SparrowsPt. B2	*5.70*	....

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	6.75
MartinsFerry,O. W10	6.50
Gary,Ind. U5	5.95

SHEETS, Galvanized Steel Hot-dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R2 .....5.45‡
Dover,O. R1 .....5.45‡
Fairfield,Ala. T2 .....5.45*
Gary,Ind. U5 .....5.45*
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ...5.45†
Irvin,Pa. U5 .....5.45†
Kokomo,Ind. C16 .....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ....5.45†
Newport,Ky. N9 .....5.45†
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ..6.20‡
SparrowsPt.,Md. B2 ..5.45‡
Steubenville,O. W10 ...5.45‡
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡ Noncontinuous.

SHEETS, Galvanized High-Strength Low-Alloy

Irvin,Pa. U5 .....8.20
SparrowsPoint(39) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.85
Irvin,Pa. U5 .....5.85
Kokomo,Ind. C16 .....5.95†
Newport,Ky. N9 .....6.00
Niles,O. N12 .....6.00

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70
Canton,O. R2 .....6.20

SHEETS, Galvanized Ingot Iron (Hot-dipped continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.30
Niles,O.(28) R2 .....6.30
Weirton,W.Va. W6 .....6.175

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.375
Cleveland R2 .....5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ...5.375
Irvin,Pa. U5 .....5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 .....5.85
Mansfield,O. E6 .....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.25

SHEETS, Well Casing

Fontana,Calif. K1 ....6.325

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng. HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div. Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless WeldedProducts
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn.Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan.San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn.(10)S15	4.05
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.20
Ecorse,Mich. G5	4.20
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Houston,Tex. S5	4.45
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
KansasCity,Mo.(9) S5	4.65
Lackaw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
NewBritain(10) S15	4.05
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15	6.45
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Houston,Tex. S5	7.10
KansasCity,Mo. S5	7.30
LosAngeles B3	7.90
NewBritn.,Conn.(10)S15	6.45
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.55
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.75
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Bridgeport,Conn.(10)S15	5.75
Cleveland A7, J5	5.75
Dearborn,Mich. D3	5.90
Detroit D2, M1	5.90
Detroit P20	5.95
Dover,O. G6	5.75
Ecorse,Mich. G5	5.90
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.65
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	6.00
Indianapolis C8	5.90
Lackawanna,N.Y. B2	5.75
LosAngeles C1	7.80
Mattapan,Mass. T6	6.30
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J. R5	7.00
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Mattapan,Mass. T6	12.80
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15	5.75	8.05	9.30	11.15	13.85
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.90	8.25	9.20	....	....
Detroit D2	5.90	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
Mattapan,Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill.(1) A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.75
Dover,O. G6	8.60
Ecorse,Mich. G5	8.75
Lackawanna,N.Y. B2	8.425
Pittsburgh J5	8.60
Sharon,Pa. S3	8.60
SparrowsPoint,Md. B2	8.425
Warren,O. R2	8.60
Weirton,W.Va. W6	8.60
Youngstown Y1	8.60

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	6.35

STRIP, Electrogalvanized

Dover,O. G6	5.75
Youngstown C8	5.75

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Arma-ture	Electric Motor		Dyna-mo
BeechBottom,W.Va. W10	....	...	9.10	10.10	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
IndianaHarbor,Ind. I-2	8.025	8.50	9.10	10.10	....
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Arma-ture	Electric Motor		Dyna-mo
Brackenridge,Pa. A4	....	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425	*8.95*	9.55	*10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225	*8.75*	*9.35*	*10.35*	*11.25*
Warren,O. R2	8.225	†9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. § Coils. ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Fairfield,Ala. T2	7.60	7.85	8.25
Fairless,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Irvin,Pa. U5	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Irvin,Pa. U5	8.80	9.05
Pitts.,Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Fairfield,Ala. T2	6.70
Fairless,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Irvin,Pa. U5	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Irvin,Pa. U5	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5	$7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.15
Jacksonville,Fla. M8	6.27
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.35
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No.Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, M8 Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Millbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Chicago A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7,T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. D2	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7	9.35
Monessen,Pa. P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.35
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester J4, T6	6.65

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Alton, Ill. L1	12.75
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
Kokomo,Ind. C16	8.05
FranklinPark,Ill. T6	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425§
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.55
Buffalo W12	6.90 7.30†
Cleveland A7	6.90 ....
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.30 7.70†
Jacks'ville,Fla. M8	7.425 7.95
JohnstownB2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.50 7.90†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85 ....
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90 ....
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
S.S.Fran. C10	7.85 8.25**
SparwsPt.B2(48)	7.00 7.55*
Sterling(1)(48)N15	6.90 7.45
Struthers,O.(48)Y1	6.90 7.40†
Worcester A7	7.20 ....

* Based on 11c zinc; † 5c zinc; ‡ Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½Ga. Col.

Ala.City,Ala R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149§
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	154†
Johnstown,Pa. (43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	158†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	154**
Monessen,Pa. 9 ga. P17	151
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	149

† Based on 5c zinc; * 11c zinc; § 10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single loop

	Col.
AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville, Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston S5	163
KansasCity,Mo. S5	167
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed

	Col.
Alabama,City,Ala. R2	159**
Aliquippa J5	156§
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	167†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	171†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	165**
Monessen,Pa. P7	163
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
S. SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	162

† Based on 5c zinc; * 11c zinc; § 10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)

	An'd Galv. Stone Stone
Ala.City R2	13.15 14.70**
Aliquippa J5	12.50 14.30§
Bartonville K4	13.25 15.10
Buffalo W12	13.15 ....
Cleveland A7	13.15 ....
CrawfrdsvilleM8	13.25 15.10
Fostoria,O. S1	13.25 14.80†
Johnstown B2	13.15 15.00*
Kokomo C16	12.60 14.15†
Minnequa C10	13.40 15.10**
Palmer,Mas.W12	13.15 14.70*
Pitts.,Calif. C11	13.50 15.05†
So.Chicago R2	13.15 14.70
SparrowsPt. B2	13.25 15.10*
Sterling(1) N15	13.15 15.00
Waukegan A7	13.15 14.70†
Worcester A7	13.45 ....

* Based on 11c zinc; † 5c zinc; § 10c zinc; ** Subject to zinc equalization extras.

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	139
Houston,Tex. S5	145
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	149
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	140
Crawfordsville,Ind. M8	140
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	140
Minnequa,Colo. C10	143
Monessen,Pa. P7	138
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill.(1) N15	138
Worcester,Mass. A7	144

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	150
Duluth,Minn. A7	150
Franklin,Pa. F5	150
Johnstown,Pa. B2	150
Marion,O. P11	150
Minnequa,Colo. C10	155
Moline,Ill. R2	155
So.Chicago,Ill. R2	150
Tonawanda,N.Y. B12	150
Williamsport,Pa. S19	150

BOLT, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants).

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
⅞ in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams.:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoes	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
¾" and smaller	55
⅞" to 1⅛", inclusive	58
1¼" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
¾" or smaller	38
⅞" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam. & larger	14
N.F. thread, all diams	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5—10
Plated finishes	30—10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
¾-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D.	B.W.	Seamless		Elec. Weld
In.	Gage	H.R.	C.D.	H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Toe Rails All No. 2	60 lb Under
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
Huntington,W.Va. W7	...	...	...	5.35
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...(16)	5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williampsort,Pa. S19	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle,Wash. B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2 Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns—83.00-148.00	
Aluminum: Atomized, 500 lb drums, frgt. allowed:	
Carlots	30.00
Ton lots	32.00
Antimony, 500 lb lots	32.00*
Brass, ¼-ton lots	29.75-37.75†
Bronze, ¼-ton lots	31.00-39.00†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, ¼-ton lots	44.25§
Nickel-Silver, ¼-ton lots	47.00**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, ¼-ton lots, 17.25-31.00‡	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.78c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c H.S. L.A.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ gage.
(48) 6 7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5 (*)	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1¼		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	13.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	41.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L	....	....	36.00	41.00	39.25	42.25	44.75	48.75	48.75
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	42.75	49.25	49.25	50.50	53.75	62.00	62.00
309S	28.50	37.50	46.75	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.50	54.50	53.25	55.50	58.75	62.75	62.75
316L	....	....	51.50	59.50	58.25	60.50	63.75	67.75	67.75
317	33.00	43.50	57.25	66.75	67.50	68.25	70.75	77.00	77.00
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	45.75	50.50	50.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	31.00	41.00	48.25	56.00	56.50	57.50	62.25	70.50	70.50
348	....	....	48.25	....	....	57.50	62.25	70.50	70.50
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	18.75	24.50	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75
501	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless:	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
302	....	31.00	31.00
304	27.60–28.10	32.50–33.20	32.50
310	36.50	41.00	....
316	32.60–33.10	37.70–42.75	42.75
318	37.00–37.50	42.20–42.70	....
321	29.36–29.80	34.40–37.00	37.00
347	30.40–30.90	35.50–40.50	40.50
405	23.40–23.90	30.60–31.10	....
410	22.00–23.40	30.10–30.60	....
430	23.40	30.60	....
Inconel	46.90	61.90	....
Nickel	38.30	51.70	....
Monel	39.70	52.66	....
Copper*	....	....	46.00

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	28.85	35.85	25.00	32.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9 C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	52.38	52.88	....	....
Birmingham U5	....	52.88	56.50†	....
Gadsden, Ala. R2	52.38	52.88	....	....
Woodward, Ala. W15	52.38	52.88	56.50†	....
Cincinnati, del.	....	*60.58*	....	....
Buffalo District				
Buffalo R2	56.00	56.50	57.00	57.50
Buffalo H1	56.00	56.50	57.00	....
Tonawanda, N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda, N.Y. T9	....	56.50	57.00	57.50
Boston, del.	66.65	67.15	67.65	....
Rochester, N.Y., del.	59.02	59.52	60.02	....
Syracuse, N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary, Ind. U5	56.00	....	56.50	....
Indiana Harbor, Ind. I-2	56.00	....	56.50	....
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago, Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon, Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron, O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem, Pa. B2	58.00	58.50	59.00	59.50
New York, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	58.00	58.50	....	....
Chester, Pa. C31	....	48.50	49.00	....
Philadelphia, del.	....	50.16	50.66	....
Steelton, Pa. B2	58.00	58.50	59.00	59.50
Swedeland, Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, del.	59.66	....	....	....
Troy, N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
Neville Island, Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, del.	....	57.87	57.87	58.37
McKeesRocks, del.	....	57.54	57.54	58.04
Lawrenceville, Homestead, Wilmerding, Monaca, del.	....	58.16	58.16	58.66
Verona, Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	....	....	....
McKeesport, Pa. N3	56.00	....	....	57.00
Midland, Pa. C18	56.00	....	....	....
Monessen, Pa. P7	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard, O. Y1	....	....	56.50	....
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield, O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	60.50	61.00	61.50	....
Fontana, Calif. K1	62.00	62.50	....	....
Geneva, Utah C11	56.00	56.50	....	....
Granite City, Ill. G4	57.90	58.40	58.90	....
Ironton, Utah C11	56.00	56.50	....	....
Lone Star, Texas L6	52.00	52.50*	52.50	....
Minnequa, Colo. C10	58.00	59.00	59.00	....
Rockwood, Tenn. T2	....	52.50*	56.50	....
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

* Low phos. southern grade. † Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	$55.00
Buffalo H1	56.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	$80.50
Keokuk, Iowa, Openhearth & Fdry, freight allowed K2	85.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	85.00
Wenatchee, Wash. OH & Fdry, freight allowed K2	85.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood, Tenn. T3	70.00
Steelton, Pa. B2	64.00
Philadelphia, del.	67.55
Troy, N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; New York and Boston, 10 cents; Buffalo, 25 cents on C.R. sheets, galv. sheets, C.F. and alloy bars and 20 cents on other commodities; Philadelphia, 10 cents, except 25 cents on alloy bars; Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.88	8.52[4]	12.04	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[3]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	44.78[5]	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.15	6.72	6.65	7.99
Carnegie, Pa.	6.38	...	8.30	....	6.72	...	6.51	7.85	12.15	6.72	6.65	6.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	45.55	6.62	...	6.51	7.50	11.90	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.66	6.72	...	6.57	7.60	11.96	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.25	7.70	9.83	....	7.60	9.30	7.60	9.40	....	7.50	7.25	8.65
Los Angeles	7.40	9.25	9.85	50.15	7.75	11.75	7.35	10.05	13.20	7.55	7.35	9.45
Milwaukee	6.47	7.47	8.39	....	6.71	...	6 60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.45	7.56	...	7.37	8.73[4]	12.28	7.38	7.27	8.48
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7 10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98[5]	6.96	8.80	6.74	8.36[4]	11.96	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	45.50	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64
Portland, Oreg.	7.60	8.75	9.70	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.26	....	7.35	7.18	8.30
San Francisco	7.55	9.85	9.35	48.15	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.05	....	7.80	...	7.80	10.85‡‡	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.14

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati, 11.50-cent zinc) except Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ¼-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb; hot-rolled products on West Coast, 2000 to 9999; [3]—500 to 9999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999 lb; [8]—f.o.b. local delivery in lots of 10,000 lb and over.

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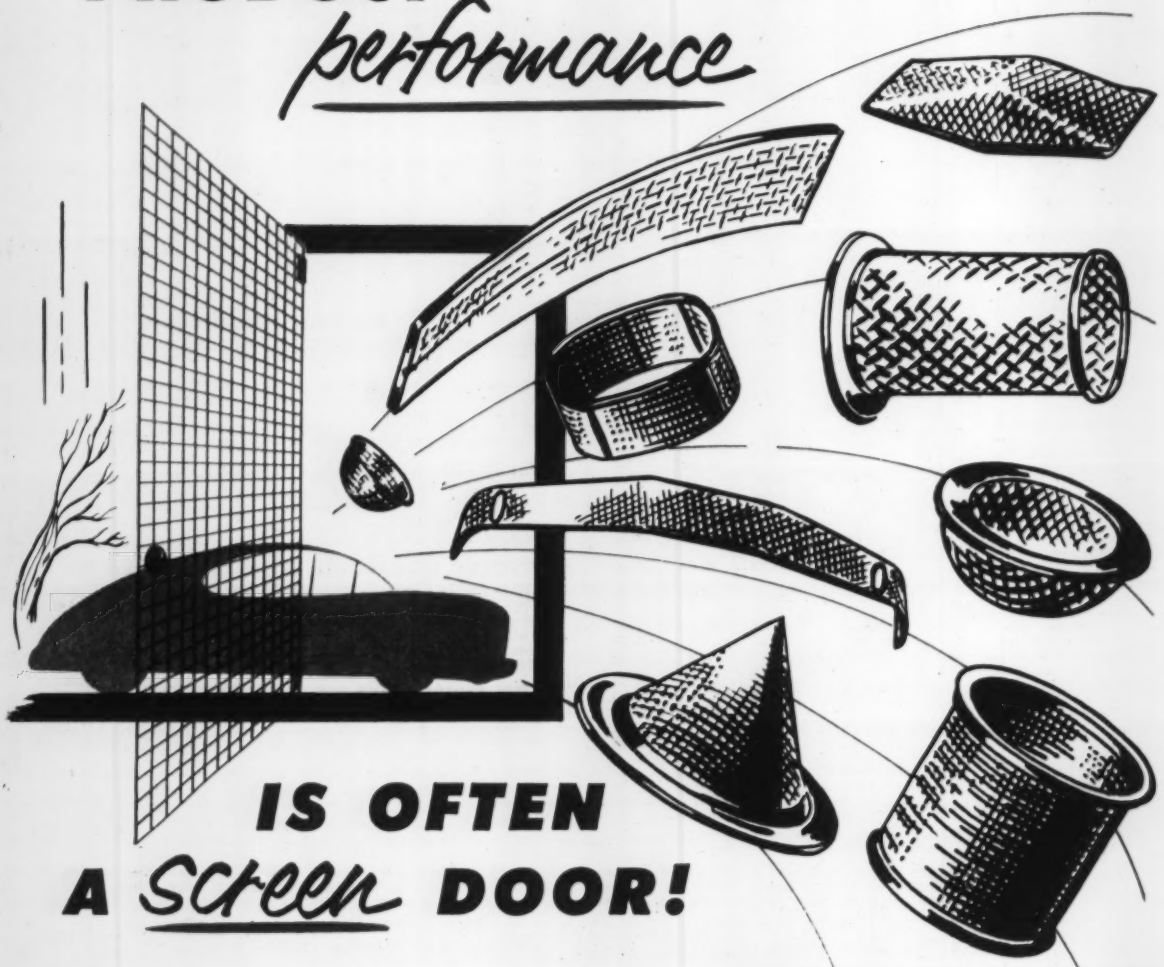

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WAGNER LITHO MACHINERY...*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS...*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

Don't count me out!

Cold-Rolled Strip Producers Answer Narrow Slit-Sheet Challenge

They don't agree with sheet people that 85 per cent of needs for narrow cold-rolled material could be supplied by slitting sheets. Here are their reasons why

YOU CAN'T keep a good product down. Producers of cold-rolled steel strip are determined not to be kayoed by the new mill pricing schedule for narrow slit sheet (see STEEL, Aug. 16, p. 151, and Sept. 20, p. 218).

The new pricing setup on cold-rolled sheet extends coverage from 12 in. down to 2 in. Previously, cold-rolled sheet was priced only in widths over 12 in. Material 12 in. and less in width took cold-rolled strip prices. The new pricing setup applies only to material of cold-rolled sheet tolerances.

Debate—Sheet producers contend that narrow slit sheet will suffice in about 85 per cent of the needs for narrow cold-rolled material. Producers of cold-rolled strip don't agree. They think they won't lose nearly that much business to sheet producers. Most of the switching, they believe, already had been done long before the new mill pricing of slit sheets was announced. One large producer of cold-rolled strip reports demand for its product is so good it is running 18 turns a week.

Producers of cold-rolled strip declare that there are applications where there is no substitute for their product. They define their product as an item where finish, temper and edge are specified and precise rolling practices are utilized. They sell their product with a guarantee for end-use. They are in a position, they point out, to make this type guarantee because standard practice restrictions are closer and more precise than in any other grade of flat-rolled product.

Tolerances—To demonstrate this, the strip producers point out that cold-rolled sheet in thickness of 0.080 in. and widths of 2 to 12 in. can vary 0.006 in. plus or minus from that thickness. Cold-rolled strip, they emphasize, in thickness of 0.080 in. will vary only 0.003 in. plus or minus in widths of 9 to 12 in., only 0.0025 plus or minus in widths of 3 to 6 in., and only 0.002 in. plus or minus in widths of 2 in.

Cold-rolled strip producers also point out their ability to provide a wide variety of finishes. Generally, the strip industry refers to a No. 1, No. 2 or a No. 3 finish.

Smooth—Actually, there are at least four categories in which No. 2 finish is supplied. No. 1 and No. 2 finishes will range from strip that has gone through sandblasted rolls to impart a finish (No. 1) that will hold drawing lubricants, to smooth-ground finish (one form of No. 2) that can be utilized for an end-use with a minimum of surface preparation.

No. 3 finish strip, sometimes known as "appliance finish," can readily be chrome plated for high luster.

The strip finishes are guaranteed for end uses, with no such exceptions as apply to sheets. The strip producers point out that the American Iron & Steel Institute's carbon steel sheet manual of June, 1954, says that sheets (not including primes) may contain surface imperfections of such a character that the product can be used with a reasonable amount of metal finishing by the purchaser.

Another attribute of cold-rolled strip is its edges, strip producers emphasize. There are six types of edges: No. 1 to No. 6.

Precision Products—Widths of cold-rolled strip are more precise than those of slit sheet, the strip producers point out. For instance, cold sheet in thicknesses of 0.0821 to 0.0681 in. can vary 0.012 in. over or under specified width, in widths of 2 through 6 in.; for the over 6 to 9 in. width range, it can be 0.016 in.; and for the over 9 to 12 in. width range, it can be 0.032 in. Cold strip in thicknesses of 0.0821 to 0.0681 in. has its width held to a plus or minus of 0.008 in. in widths of 2 through 6 in.; in widths over 6 in. through 12 in., the width does not vary over or under by more than 0.010 in.

Five different tempers are provided by cold-rolled strip, No. 1 (hard) through No. 5 (dead soft). Strip mills will work when necessary to specified Rockwell hardness limits.

And to emphasize further that theirs is an industry of precision products, the producers of cold-rolled strip say that tolerances, if necessary, can be kept 80 per cent more precise than those specified as standard. They attain this goal by special rolling equipment and practices.

Fasteners Show Gains

Bolt and nut producers have two reasons to view the present market with a sense of well being: Foreign competition has subsided from the midsummer peak, and demand for their products has risen steadily over the last four to six weeks.

Producers point out that 2.5 per cent of all finished steel ends up in fasteners. As steel production goes up, as it has since early September, so does the fastener business. Two-

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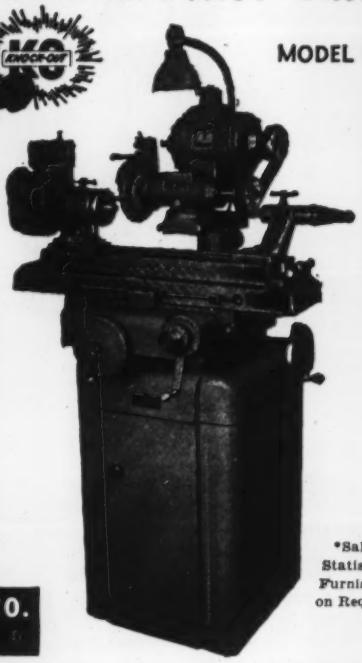

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day delivery could be had on most sizes of bolts and nuts in June and July, but now one producer quotes 30 days on many sizes. Backlogs of four to six weeks are common, although heavy fasteners can be had in somewhat less time. The general situation is such that some manufacturers are even turning down immediate delivery orders.

Much of the talk about foreign competition is just that—talk. It is hurting in some local markets—such as Florida—but the volume of imports in the fastener business is of little consequence in the over-all market. It represents tough competition, but producers are prepared to meet it. What has the industry more worried is the possible threat of imports in the future. Spokesmen admit it could get serious if European and Japanese producers should suffer business losses in their own countries and decide to dump surpluses on the American market. They also are worried about the extent of United States' participation in the General Agreement on Tariff & Trade.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 243 & 244

Automotive buying stands out in the sheet market with orders beginning to pile up on mill books. Stronger demand is especially noticeable in the cold-rolled classification, but galvanized sheets are continuing in strong demand, and hot-rolled sheets and specialties are moving better, though at somewhat slower pace than other flat-rolled items.

Combination of low inventories and increased operations accounts for the pickup in buying interest by consumers seeking to cover requirements over the remainder of the year. This interest is gaining as shipment deliveries become extended.

Leading Midwest mills are heavily booked on cold-rolled sheets and strip, in some instances being sold out over remainder of the year. Similar situation prevails in galvanized sheets, one Chicago mill now booking tonnage into January. In hot-rolled sheets and strip, however, some sellers can still give delivery in two to three weeks.

Sheet business in the East is more buoyant than that of other major products. Deliveries are extended on both hot-rolled and cold-rolled, but consumers in the district can still get good delivery promises by shopping around. In general, hot sheet deliveries extend three weeks and beyond, while cold-rolled extend at least six weeks. Galvanized deliveries run into first quarter on the continuous product.

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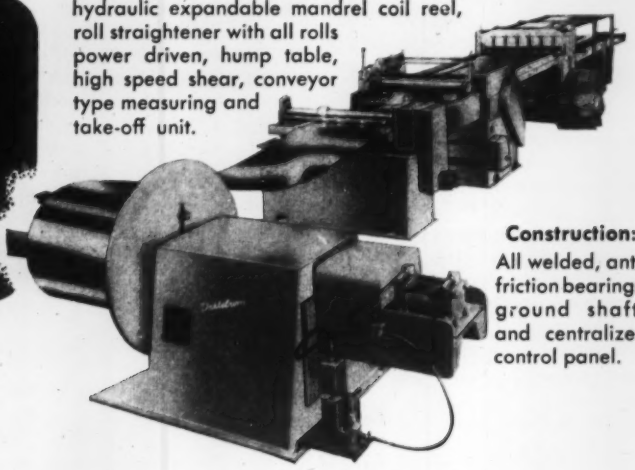

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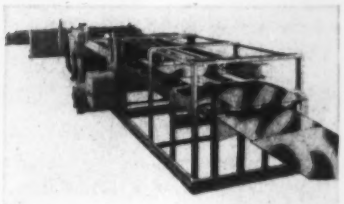

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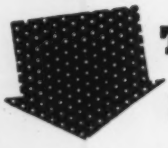

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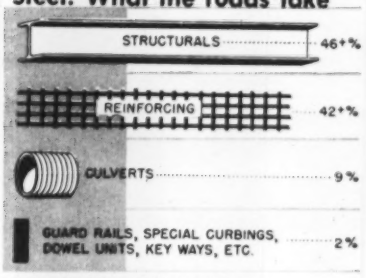
Road Steel Up 20 Per Cent

This year about 38,000 miles of roads and highway construction will consume about 1.5 million tons of steel. Last year 1.25 million tons went into 29,000 miles of construction. Better news yet for steelmen is the estimated 1.8 million tons of steel which will be required for road-building in 1955. Bureau of Public Road says between 420 and 450 tons of steel products, on the average, are required for every million dollars spent on U. S. highways. Breakdown of those products, based on 1953 figures, is shown in the accompanying graph.

Steel: What the roads take



Source: American Iron & Steel Institute

Stainless Steel . . .

Stainless Steel Prices, Page 246

General increase in orders and shipments, along with completion of a nine-year plant improvement program, give Allegheny Ludlum Steel Corp. a brighter outlook for fourth quarter, says E. J. Hanley, company president.

U. S. Steel Corp. has issued a new base price list (dated Oct. 16) on stainless steels. Changes (both increases and decreases) involve AISI No. 304, No. 304L, No. 316L, and No. 347.

Plates . . .

Plate Prices, Page 242

The sluggish demand for plates is intensified by the seasonal slackening in construction requirements.

Bookings of wide and heavy plates are off from recent weeks, but lighter specifications continue to move fairly well despite the low ebb of freight car building and repair. Shipwork is limited.

Naval needs are expanding a little. At the same time tank and boiler shop requirements are seasonally better. Warehouses also are ordering tonnage a little more freely. Relatively good volume is reported going to the chemical industry for pressure vessels.

While plate business leaves much to be desired, some October rollings will surpass September schedules slightly.

Mirroring the slow market, generally, producers can still give deliveries in one to two weeks on sheared and universal plates.

Structural Shapes . . .

Structural Shape Prices, Page 242

Seasonal leveling off in demand for structurals is in evidence but order volume still is described as good. Contracting is fairly brisk at some points. Considerable work on drawing boards remains to come out.

Major activity is in bridge work though general commercial volume is fairly sustained. Industrial building is slower.

Competition for new work is keen. In New England this is especially notable on business involving less than 500 tons. While frequently under engineering estimates, direct bids on larger tonnages are sometimes higher. This is true of the 3800-ton Connecticut bridge superstructure, West Springfield, Mass.

Demand for larger structurals is showing further weakening at Chicago, reflecting the approaching winter lull in heavy construction. Volume in smaller shapes, and especially wide flange sections, is holding up well.

Tubular Goods . . .

Tubular Goods Prices, Page 246

Pressure for oil country tubular goods is off somewhat, but consumers are ordering with less lead time and most mills expect brisk sales through the fourth quarter.

Mechanical tubing is moving more actively while continued active construction is reflected in steady shipments of standard pipe.

October pipe order volume is reported slightly ahead of that in September by New England district sellers.

Pipe jobbers catering to home plumbing and heating requirements are busy, but those specializing in heavier type needs of commercial and industrial contractors find business slowing down seasonally.

Of the 7900 tons of 16-in. seamless required for bombs being fabricated at Portland, Me., 3100 tons will be produced in December schedules and the entire lot cleared by second quarter of next year. A large tonnage of 24-in. seamless for 3000-lb bombs is being estimated.

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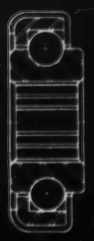

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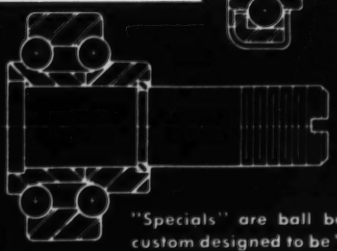

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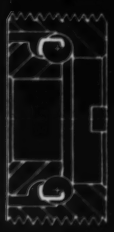

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Wire . . .

Wire Prices, Pages 244 & 245

Specifications for manufacturers wire are reported increasing, but merchant products are in spotty demand seasonally. Demand for nails is reported strong. Because numerous special facilities are being constructed throughout the country, demand for security fencing is heavier. For those in the Boston area, Anchor Post Products Inc. will erect fencing costing $49,735.

Jobbers' inventories are low, and mills are expecting a revival in orders this month. In the Chicago district, demand for manufacturers wire items (due to automotive activity) is reported at least a third better than that in August and September.

Tin Plate . . .

Tin Plate Prices, Page 244

October shipments of tin plate are trailing those for September, reflecting seasonal decline in requirements. The September movement was heavy, consumers beating the price increase that went into effect Oct. 1.

Steel Bars . . .

Bar Prices, Pages 242 & 243

Gradual pickup in commercial bar demand is in evidence at virtually all market points. Inquiry is noticeably better and is diversified. Deliveries, however, have not tightened appreciably though sellers expect shipments to become extended as automotive requirements come out.

Mills can give shipments in from one to four weeks on hot-rolled carbon bars, depending on rolling cycles. Cold-finishers can promise nearby shipments, some being able to ship out of stock on a variety of specifications. Deliveries on hot-rolled and cold-drawn alloy bars extend a little longer, three to five weeks.

Although farm equipment production continues to lag, Midwest bar sellers report demand a little stronger.

Rails, Cars . . .

Track Material Prices, Page 245

Rehabilitation and modernization of No. 2 rail mill at Edgar Thomson Works of U. S. Steel Corp. assures continuance of the Braddock, Pa. plant as a major rail manufacturing center. Modern reheating furnace facilities and relocation of roll stands are planned. Earlier this year work was started on facilities for end-hardening of rails.

Missouri Pacific railroad plans the purchase of 66 diesel locomotives at an estimated cost of $11 million.

Steel Import Prices

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$5.05	$5.05	$4.95	$5.33
Bar Size Angles	4.60	4.60	4.60	4.98
Structural Angles	4.55	4.55	4.55	4.98
I-Beams	4.50	4.50	4.50	4.83
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.50	5.78
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.80	27.00	26.80	27.60
Barbed Wire (†)	6.05	6.05	6.05	6.23
Merchant Bars	4.95	4.95	4.95	5.33
Hot-Rolled Bands	5.15	5.15	5.15	5.43
Wire Rods, Thomas Commercial No. 5	5.10	5.17	5.15	5.42
Wire Rods, O-H Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Bright Common Wire Nails	6.85	6.95	6.90	7.15

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling. †Per 82-lb, net, reel.

Sizes OD				
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

Warehouse . . .

Warehouse Prices, Page 247

Steel distributors report customers' requirements are on a plateau. No trend is apparent in fourth quarter purchasing across the northeastern section of the country, says the manager of a large warehouse chain. Improvement in sales is not expected while mills continue to fill many small orders.

While hurricane repairs brought some orders to eastern distributors, volume is marked by individual small lots for all products. Tightness in galvanized sheets and other flat-rolled grades at the mill level is not duplicated at the warehouse level.

Iron Ore . . .

Iron Ore Prices, Page 257

Consumption of Lake Superior iron ore in September totaled 4,619,843 gross tons, reports the Lake Superior Iron Ore Association. In August use amounted to 4,894,874 tons, and in September, 1953, it was 7,699,110 tons.

Consumption in the first nine months this year amounted to 49,442,501 tons against 72,212,543 in the like period of 1953.

Stocks on Lake Erie docks and at furnaces on Oct. 1 were 49,752,763 gross tons. This compares with 45,732,804 tons on Sept. 1, and with 51,766,772 on Oct. 1 a year ago.

Shipments of iron ore in the latest week of record (ending Oct. 18) were reported at 1,547,447 gross tons, bringing the season's movement to that date to 54,677,330 tons. In the like week of 1953 shipments amounted to 2,601,739 tons; season movement to that date was 85,890,118 tons.

Pig Iron . . .

Pig Iron Prices, Page 247

Additional blast furnaces are being lighted to meet improved demand, both registered and anticipated. Slightly better buying interest is traced to a little better demand for castings and the further drop in pig iron inventories held by consumers.

In the Cleveland district, Jones & Laughlin Steel Corp. relighted its No. 2 blast furnace, idle since Dec. 17, 1953. This furnace produced an average of 832 tons a day in the first six months of 1953. Republic Steel Corp. also relighted a furnace last week, making a total of four in blast out of a total of six at that plant.

Blast Furnace Output Rises

Blast furnace production gained slightly from August to September but was off sharply from September a year ago, reports the American Iron & Steel Institute.

Output was 4,461,822 net tons, of which 4,417,888 tons were pig iron and 43,934 tons ferromanganese and spiegeleisen. This compares with 4,567,035 tons in August, 4,529,291 tons being pig iron and 37,744 ferromanganese and spiegeleisen. In September, 1953, output was 6,202,019 tons, of which 6,132,330 were pig iron and 69,689 ferromanganese and spiegeleisen.

Total production in the first nine months this year was 42,857,333 net tons. Of this 42,447,089 tons were pig iron and 410,244 ferromanganese and spiegeleisen. In the like 1953 period output was 57,503,609 tons, of which 56,855,327 were pig iron and 648,282 ferromanganese and spiegeleisen.

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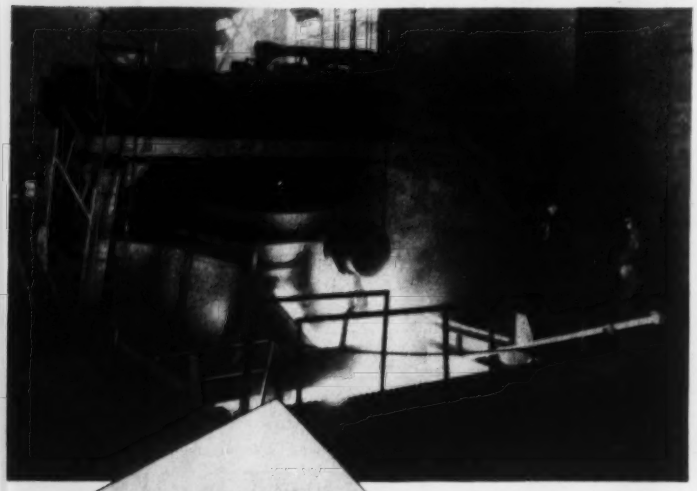
IngAclad

Stainless-Clad Steel



With IngAclad *stainless-clad* steel, you get all the advantages of solid stainless—yet *at much lower cost*. Same corrosion resistance.* Same protective properties. And—it's easier to fabricate.

Double saving—lower material costs, lower fabricating costs. 20% thickness of solid stainless, inseparably bonded to 80% backing of mild steel.

* On stainless side

IngAclad — *for lowest cost stainless protection*

ALSO: SOLID STAINLESS AND HEAT-RESISTING STEELS

Write, wire or phone for details **Ingersoll**

ENGINEERING B-W PRODUCTION

STEEL DIVISION

Borg-Warner Corporation

310 S. Michigan Ave., Chicago 4, Illinois

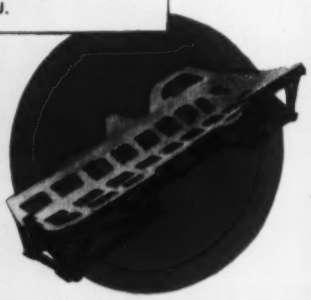
Plant: New Castle, Indiana

SAVE • *Tooling TIME 70%* • *Tooling COSTS 50%*

Use **Ren-ite* modified epoxy resins, the first dimensionally stable plastic for industrial tooling applications.**

Leading manufacturers are making big savings in their tooling programs with Ren-ite thermosetting resin materials—so can YOU.

No heat or pressure is needed when Ren-ite is used. Try it in YOUR tooling program. Write for full information and price schedules on complete line.



Ren-ite Spotting Rack

You can be SURE when you use Ren-ite modified epoxy resins for master Keller models, skin panels, checking and welding fixtures, dies and prototypes, or other tooling applications.

● FREE ENGINEERING SERVICE—NO CONTRACTS REQUIRED ●

Ren-ite PLASTICS, INC.

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OFFICES IN CHICAGO, CLEVELAND, DETROIT, LOS ANGELES, NEW YORK AND ST. LOUIS.

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The Cleveland Steel Tool Co.

• PUNCHES • DIES • CHISELS • RIVET SETS •

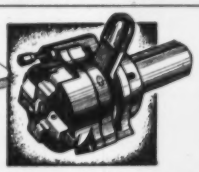
IF IT'S *RIVETED* YOU KNOW IT'S SAFE

●

WE FEATURE SPECIAL PUNCHES & DIES

660 E. 82nd ST., CLEVELAND, O.

H&G Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*

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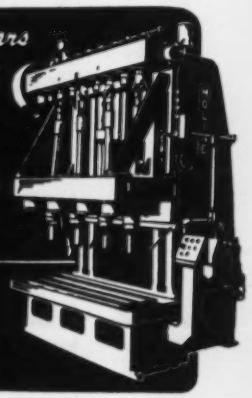
"HOLE-HOG"

Specially Designed

MACHINE TOOLS

Have Cut Production Costs for American Industry



MOLINE TOOL CO.

No. HU68 Hydraulic rail-feed universal joint type multiple spindle drilling machine

Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 52-62% concentrates contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$24.00-25.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 80c.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

(Rail nearest seller)

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines unpacked $1.00

Antimony Ore

Per unit of 8b content, c.i.f. seaboard

50-60%	*$3.50-$3.90*
60-65%	*4.10-4.50*

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $114; Salina, Pa., $119; Niles O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa., $130.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala. $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Peria, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Pa., $183.50; Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, deadburned bulk, ⅝-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net ton, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5¼	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.00
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

they all know the best place in Cleveland

"Hotel Cleveland, sir?"

Whether you arrive by train, plane or car, the friendliest place to stay is Hotel Cleveland, directly connected with Union Terminal.

No room charge for children under 14 when registered with an adult.

Hotel Cleveland

SONNABEND OPERATED HOTELS

Distinguished American Landmarks

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BOSTON: Hotel Somerset
NEW YORK CITY: Ritz Tower Hotel
CLEVELAND: Hotel Cleveland

ATTENTION: *Fabricators of Metal !*

BRITISH COLUMBIA
CANADA

CANADA'S GATEWAY TO THE PACIFIC

PACIFIC GATEWAY TO CANADA

EXTENDS AN *Invitation* TO INDUSTRY

POWER: Available water power, 1,358,000 H.P., with huge potential of 11,000,000 H.P. Natural gas assured in the near future.

RAW MATERIALS: $165,000,000 Mining Industry provides basic and industrial minerals in quantity, with great resources untapped.

TRANSPORTATION: Year-round deep-sea ports—four railways—modern highways—airlines to world centres.

PLANT SITES: Industrial sites in all areas for light and heavy industries.

LABOR: Plentiful supply of good skilled and unskilled labor as population increase tops the Nation.

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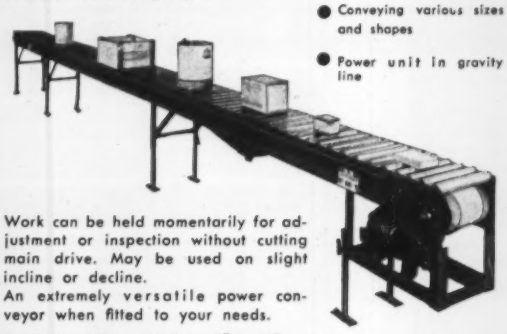
Write Now for further information. Your enquiry will receive prompt, confidential attention.

DEPARTMENT OF TRADE AND INDUSTRY
Parliament Buildings. Victoria, B.C., Canada.
HON. RALPH CHETWYND, Minister.
E. G. ROWEBOTTOM, Deputy Minister.

METZGAR LIVE-ROLLER CONVEYOR

Specifically Recommended for

- Moving sharp-cornered and rough-edged items
- Conveying various sizes and shapes
- Power unit in gravity line



Work can be held momentarily for adjustment or inspection without cutting main drive. May be used on slight incline or decline.
An extremely versatile power conveyor when fitted to your needs.

Standard widths: 11½" — 15" — 18" — 24". Length to suit. Conveyors up to 30' are powered by a 110 V. single phase gearhead A.C. or D.C. motor; longer units, 220/440 three phase A.C. or D.C. Roller spacing as required. Factory lubricated for life.

Our engineers can help you most when you explain your requirements fully. Ask for Bulletin J-1.

- Production-line work movement
- Handling heated and heat-treated items

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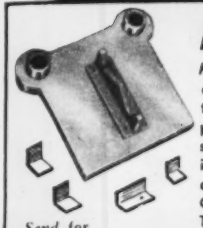
409 Douglas, N. W.
MFRS. OF WHEEL & ROLLER GRAVITY & LIVE ROLLER CONVEYORS • POWER BELT CONVEYORS • SWITCHES • ACCESSORIES & REEL DOLLIES
GRAND RAPIDS 4, MICH.

M. D. Hubbard Spring Company
404 Central Avenue
Pontiac 12, Mich.

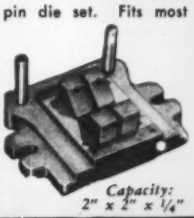
STEEL TUBING
SERVICE STEEL
SEAMLESS or WELDED
AIRCRAFT • MECHANICAL
PRESSURE • STAINLESS
STAINLESS PIPE & FITTINGS
DETROIT • BUFFALO • CHICAGO • CINCINNATI • LOS ANGELES

Punches and Dies



Angle Iron Cut-Off Die

Mounted in leader pin die set. Fits most all makes of 25-ton and larger presses. Simple shearing action insures straight, clean cut WITHOUT DISTORTION. Just one of our many standard stock-dies.



Capacity: 2" x 2" x ¼"

Send for free illustrated catalog No. 154 AD.

WARD Machinery Co. 564 West Washington **Chicago 6**

Scrap . . .

Scrap Prices, Page 260

Philadelphia — Based on small domestic sales but also mirroring continued substantial demand from abroad, No. 1 heavy melting and No. 1 bundles are quoted at $31.50 delivered, No. 2 heavy melting at $29.50 and No. 2 bundles at $26.50.

Scrap exports this month will probably fall short of the 25,000 tons shipped in September by 3000 tons.

Boston—Steel scrap prices are moving upward on both domestic and export business. Several grades are quoted $1 to $1.50 higher with No. 1 heavy melting $23 and $27, shipping point and dock, respectively. No. 1 steel is in short supply at more yards.

New York—Brokers' buying prices are steady except for unstripped motor blocks, which are higher at $22 to $23. Undertone of the market is strong, primarily because of export demand. There is further quickening, however, of domestic interest.

Pittsburgh—Several small lots of No. 1 heavy melting scrap sold at $35 a ton, but last week's range of $32 to $33 ruled on the bulk of sales. Steelmakers are declining offers of large No. 1 tonnage at the higher price. As evidence of price stability, a large local mill paid $27 for No. 2 bundles early last week—the same price previously quoted. Cast iron market is quiet. No. 1 railroad heavy melting rose $1. Range is $35 to $36.

Cleveland — A strong undertone continues in scrap despite the absence of active mill buying. Auto lists are expected out around end of the month, but are likely to be smaller than usual because of curtailed operations in the auto plants. So a little more active demand for dealer scrap is anticipated over coming weeks. Meanwhile, prices are holding with No. 1 heavy melting quoted $33, delivered locally, tops.

Cincinnati — Market quotations shot up further, led by No. 1 steel and short shovel turnings. All No. 1 grades advanced $1.50 a ton to a range of $29 to $30. No. 2 heavy melting also rose $1.50 to $26 to $27.

Detroit—Scrap prices remain unchanged though there is still considerable strength in the market.

Chicago—Return of the district ingot rate to 77.5 per cent of capacity, highest since the first week of July and a gain of over 10 points since Labor Day, is not fully reflected in the scrap market. Consumption has not increased camparably.

In the last 10 weeks, No. 1 heavy melting steel and No. 1 factory bundles went up $3 a ton.

St. Louis—Scrap market undertone is firmer but without a general price rise. Some brokers' buying quotations are up, primarily to prevent shipments bypassing them to the Chicago market. Railroad items are higher. Rerollers rose $3 in the last two weeks.

Los Angeles—Contrary to the national trend, the cast iron scrap market in this district has firmed on continued purchases of no. 1 cupola cast by foundries. Demand for steelmaking scrap lags.

San Francisco—Steel scrap dealers are optimistic. They see a coming price boost now that the Los Angeles market has firmed.

Seattle—Scrap is unchanged with $25 and $21 quoted on No. 1 and No. 2 heavy melting steel, respectively. Supply and demand are in balance. Cast iron is moving up to $35 for No. 1 cupola.

Ferroalloy Prices

FERROALLOY quotations remain unchanged. The current price schedule was published in full on page 156 of the Oct. 18 issue of STEEL.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

700 tons, grade structures, Lincoln Square project, Worcester, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through V. Barletta Co., Boston, general contractor.

135 tons, plant building, Hercules Powder Co., Parling, N. J., to Keystone Structural Steel Co., Trenton, N. J.

110 tons, bridge, Pine Crossing, Scarboro, Me., to Bancroft & Walker Rolling Mills Co., South Portland, Me., through Frank Rossi, Gardiner, Me., general contractor.

STRUCTURAL STEEL PENDING

13,500 tons, structural tunnel lining, Hampton Roads, Va., State Highway Department, Merritt, Chapman & Scott Corp., New York, low on general contract.

(*Please turn to page* 262)

LEWIS
TRAVEL-CUT
automatic, high-speed heavy-duty
WIRE STRAIGHTENING
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CUTTING MACHINES
Sizes for .012" to ¾" WIRE
ROUNDS & SHAPES
THE LEWIS MACHINE CO.
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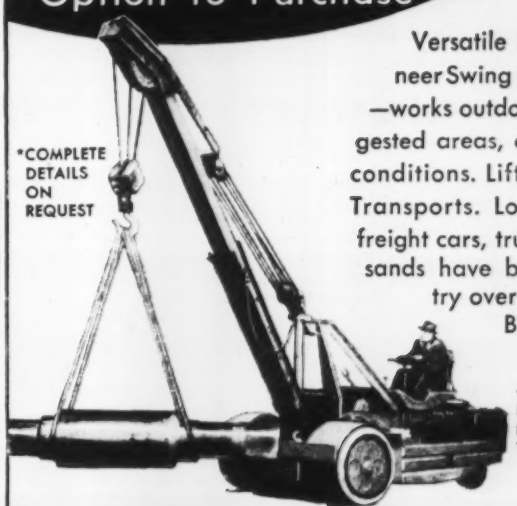
Lease-a-KRANE KAR-Plan
1 to 3 Year Lease with Option to Purchase*



*COMPLETE DETAILS ON REQUEST

Versatile *KRANE KAR*—pioneer Swing Boom Mobile Crane—works outdoors, indoors, in congested areas, on adverse ground conditions. Lifts, Swings, Places, Transports. Loads and unloads freight cars, trucks, trailers. Thousands have been serving Industry over 25 years. ASK FOR BULLETIN NO. 79C.

Gas or Diesel; 9 to 37 ft. Booms or Telescopic Booms; Pneumatic or Solid Rubber Tires.

"Silent Hoist" KRANE KAR Swing Boom Mobile Crane . . . 1½, 2½, 5, 10, and 12½ Ton Cap.

SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
849 63rd Street, Brooklyn 20, N. Y.

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Oct. 20	$32.33
Oct. 13	32.00
Sept. Avg.	29.94
Oct., 1953	32.75
Oct, 1949	26.71

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	32.00-33.00
No. 2 bundles	26.00-27.00
No. 1 busheling	31.00-32.00
Machine shop turnings	18.00-19.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	*22.00-23.00*
Cast iron borings	*22.00-23.00*
Cut structurals, 5 ft lengths	33.00-34.00
Heavy turnings	*30.00-31.00*
Punchings & plate scrap	*36.00-37.00*
Electric furnace bundles	34.00-35.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	32.00-33.00
Heavy breakable cast	31.00-32.00
Unstripped motor blocks	23.00-24.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00-36.00*
Rails, 2-ft and under	44.00-45.00
Rails, 18-in. and under	45.00-46.00
Rails, random lengths	38.00-39.00
Railroad specialties	36.00-37.00

Stainless Steel Scrap

18-8 bundles & solids	180.00-190.00
18-8 turnings	85.00-90.00
430 bundles & solids	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*32.00-33.00*
Machine shop turnings	15.00-16.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Low phos.	*34.00-35.00*
Cut structural plate 2 ft and under	*37.00-38.00*
Alloy free, short shovel turnings	*22.00-23.00*
Electric furnace bundles	*33.00-34.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	*33.00-34.00*
Stove plate	*38.00-39.00*
Heavy breakable cast	*30.00-31.00*
Unstripped motor blocks	*30.00-31.00*
Brake shoes	*31.00-32.00*
Clean auto cast	44.00-45.00
No. 1 wheels	*37.00-38.00*
Burnt cast	*29.00-30.00*
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00-36.00*
R.R. malleable	*44.00-45.00*
Rails, 3-ft and under	*46.00-47.00*
Rails, 18 in. and under	*48.00-49.00*
Rails, random lengths	*43.00-44.00*
Cast steel	36.00-37.00
Railroad specialties	36.00-37.00
Uncut tires	37.00-38.00
Angles, splice bars	*43.00-44.00*
Rails, rerolling	*55.00-56.00*

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	*170.00-180.00*
18-8 turnings	70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	*27.00-28.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Low phos.	*35.00-36.00*
Electric furnace bundles	*35.00-36.00*

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting	32.00-34.00
No. 2 heavy melting	31.00-32.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles	33.00-34.00
No. 2 bundles	23.50-24.50
No. 1 busheling	32.00-34.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3-ft	35.00-36.00
Punchings & plate scrap	*35.00-36.00*
Electric furnace bundles	34.00-35.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	33.00-34.00
Unstripped motor blocks	25.00-26.00
Clean auto cast	43.00-45.00
Drop broken machinery	43.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	42.00-44.00
Rails, 2-ft and under	*50.00-51.00*
Rails, 18-in. and under	*51.00-52.00*
Angles, splice bars	*43.00-44.00*
Rails, rerolling	*55.00-57.00*

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00
430 turnings	20.00-25.00

Chicago Mercantile Exchange

No. 1 Heavy Melting
(Week ended Oct. 20)

	High	Low	Close
Jan.	37.75	36.50	37.00
Mar.	37.50	37.00	37.00

Sales (40-ton units): 7 January: 2 March.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00
No. 2 heavy melting	21.50
No. 1 bundles	27.50
No. 2 bundles	20.00
No. 1 busheling	26.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	16.00
Punchings & plate scrap	27.00

Cast Iron Grades

No. 1 cupola	34.00
Charging box cast	27.00
Stove plate	30.00
Heavy breakable	25.00
Unstripped motor blocks	20.00
Clean auto cast	38.00
Malleable	30.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	20.50-21.50
No. 1 busheling	*29.00-30.00*
Machine shop turnings	*15.50-16.50*
Mixed borings, turnings	*15.50-16.50*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*15.50-16.50*
Low phos. 18-in.	34.00-35.00

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast	36.00
Charging box cast	36.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18-in. and under	46.00-47.00
Rails, random lengths	38.00-39.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*31.50*
No. 2 heavy melting	*29.50*
No. 1 bundles	*31.50*
No. 2 bundles	*26.50*
No. 1 busheling	28.50-29.00*
Electric furnace bundles	*32.50*
Machine shop turnings	*17.50*
Mixed borings, turnings	19.00
Short shovel turnings	*20.00-21.00*
Structurals & plate	34.00
Heavy turnings	*29.00*
Couplers, springs, wheels	34.00
Rails crops, 2 ft & under	45.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Malleable	37.00*
Heavy breakable cast	36.00
Drop broken machinery	*42.00-43.00*

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	26.00
No. 2 heavy melting	24.00
No. 1 bundles	28.00
No. 2 bundles	20.00
Machine shop turnings	9.00-10.00
Mixed borings, short turnings	11.00-12.00
Low phos. (structural & plate)	29.00-30.00
Short shovel turnings	12.00-13.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	*22.00-23.00*

Stainless Steel

18-8 sheets, clips, solids	170.00-175.00
18-8 borings, turnings	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*22.00-23.00**
No. 2 heavy melting	*17.25-18.25*
No. 1 bundles	*23.00-24.00*
No. 2 bundles	*16.00-17.00*
Mixed borings, turnings	10.00-10.50
Machine shop turnings	*8.50-9.00*
Short shovel turnings	*11.50-12.00*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	32.00-33.00

* $4 to $4.50 higher for export.

BUFFALO

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	26.50-27.50
No. 1 bundles	30.00-31.00
No. 2 bundles	24.50-25.50
No. 1 busheling	30.00-31.00
Machine shop turnings	15.50-16.50
Mixed borings, turnings	17.50-18.00
Short shovel turnings	18.50-19.00
Cast iron borings	17.50-18.00
Low phos.	33.00-34.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	36.00-37.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

BIRMINGHAM

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	23.00-24.00
No. 2 bundles	19.00-20.00
Cast iron borings	16.00-17.00
Short shovel turnings	16.00-17.00
Machine shop turnings	15.00-16.00
Electric furnace bundles	29.00-30.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	32.00-33.00
Structural plate, 2 ft	32.00-33.00
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	30.00-31.00
Rails, 18-in. and under	40.00-41.00
Rails, rerolling	40.00-41.00
Angles, splice bars	38.00-39.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	30.00
No. 2 bundles	*23.50*
Machine shope turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	38.00
Charging box cast	29.00
Heavy breakable cast	29.00
Unstripped motor blocks	29.00
Brake shoes	30.00
Clean auto cast	*41.00*
Stove plate	34.00

Railroad Scrap

No. 1 R.R. heavy melt	35.00
Rails, 18-in. and under	46.00
Rails, random lengths	*48.00*
Rails, rerolling	53.50
Angles, splice bars	*44.00*

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	25.00
No. 2 heavy melting	21.00
No. 1 bundles	21.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	12.00
Electric furnace, No. 1	32.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*32.00-35.00*
Heavy breakable cast	23.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate(f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	18.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	43.00-46.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

HAMILTON, ONT.

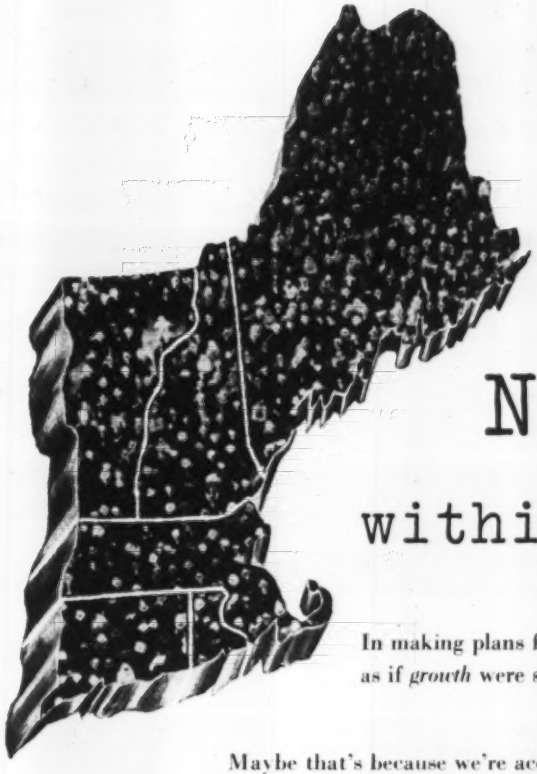
(Delivered prices)

No. 1 heavy melting	$22.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory: Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



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(Continued from page 259)

13,000 tons, state bridge, Rappahanock river, Grey's Point, Va.; Bethlehem Steel Co., Bethlehem, Pa., low.

2400 tons, state highway, including bridge, Neponset river, Boston-Quincy, Milton, Mass.

2035 tons, sixth phase of The Dalles dam project, Columbia river; bids to U. S. Engineer, Portland, Oreg., Dec. 15.

1750 tons, highway structures, Porter-La Porte counties, Indiana; bids Nov. 3, Indiana Toll Road Commission, Indianapolis, contracts C-17 to C-19, inclusive.

1500 tons, four grade crossing eliminations, New Haven railroad, Mansfield, Mass.; bids Nov. 16, Department of Public Works, Boston.

550 tons, state bridge, Laham, Md.; bids Oct. 26.

550 tons, highway structures, Gary, Ind.; bids Nov. 3, Indiana Toll Road Commission, Indianapolis, contract C-10A.

335 tons, bridges, one plate girder and one four-span beam structure, Boston-Fall River expressway, Fall River, Mass.; Callen Construction Co., Bristol, R. I., low, general contract, $1,544,065.

326 tons, state turnpike bridge, Carbon county, Pa.; bids Nov. 3.

300 tons, municipal filtration plant, Toledo, O.; bids Nov. 3.

250 tons, state bridge, Towson, Md.; bids Oct. 26.

200 tons, Pennsylvania railroad grade crossing elimination, Franklin Park road, New Brunswick, N. J.; bids Oct. 28. Also required are 105 tons of reinforcing steel.

150 tons, addition to plant, Medusa Portland Cement Co., York, Pa.; pending.

100 tons or more, 302-ft Idaho state bridge, Kootenai county; Hansen & Parr, Spokane, Wash., low at $52,978.

100 tons or more, two multi-purpose wing hangars, Larson Field, Washington state; bids to U. S. Engineer, Walla Walla, Wash., Nov. 16.

50 tons, addition, Navy air station, Willow Grove, Pa.; bids Nov. 18.

REINFORCING BARS . . .

REINFORCING BARS PLACED

5100 tons, sixth phase of The Dalles dam; bids to U. S. Engineer, Portland, Oreg., Dec. 15.

600 tons, First Ave. south state bridge, Seattle; bids in.

525 tons, state turnpike section 35-E, Bucks county, Pa., to Electric Welding Co., Pittsburgh.

400 tons, Lincoln Square project, Worcester, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through V. Barletta Co., Boston, general contractor.

285 tons, 2.5 million-gal reservoir, Ft. Richardson, Alaska; general contract to L. & L. Construction Co. and M. B. Construction Co., Seattle, joint low to U. S. Engineer at $462,426.

270 tons, Kennewick canal, Yakima project, Washington state; bids to Bureau of Reclamation, Denver, about Nov. 20.

210 tons, including shapes, Crescent Lake earth-fill dam, Klamath county, Oreg.; bids to Bureau of Reclamation, Madras, Oreg., Nov. 17.

100 tons, two rocket buildings, Elmendorf and Ladd air bases, Alaska; bids to U. S. Engineer, Anchorage, Alaska, Nov. 3; No. 55-37.

100 tons, launcher project, Olalla, Wash.; John P. Hopkins Co., Mercer Island, Wash., low at $392,169.

100 tons, Washington state highway projects, Snohomish and Spokane counties; bids to Olympia, Wash., Oct. 19.

100 tons, ammunition igloos, Whittier, Alaska; general contract to Pacific Alaska Contractors, Tacoma, Wash., low at $321,707.

100 tons or more, expressway separation, Marion county, Oreg.; bids in.

100 tons or more, two 200-man barracks, Ladd Air Base, Alaska; Grove, Shepherd, Wilson & Kruge, Seattle, low at $1,362,205.

100 tons, Ryan Cadillac warehouse, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, warehouse, Ft. Richardson, Alaska, to Bethlehem Pacific Coast Steel Corp.,

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Seattle; Lease & Leighland, Seattle, general contractors.

100 tons, Lits Bros., Camden, N. J., to American Steel Engineering Co., Philadelphia.

REINFORCING BARS PENDING

795 tons, highway structures, Porter-La Porte counties, Indiana; bids Nov. 3, Indiana Toll Road Commission, Indianapolis, contracts C-17 to C-19, inclusive.

440 tons, six state bridges, Everett, Mass.; bids Oct. 26, Boston.

305 tons, high school, Abbington, Pa.; Baton Construction Co., Philadelphia, low on general contract.

800 tons, state bridgework, contract 173, Atlantic and Cape May counties, to Merritt, Chapman & Scott Corp., New York, low on general contract.

125 tons, highway structure, Gary, Ind.; bids Nov. 3, Indiana Toll Road Commission, Indianapolis; contract C-10A.

105 tons, grade crossing elimination work, Pennsylvania railroad, Franklin Park road, New Brunswick, N. J., bids Oct. 28; 200 tons of structurals also required.

PLATES . . .

PLATES PENDING

1855 tons, structural type; bids Nov. 5 Air Force Depot, Topeka, Kan. inv. 145-B.

1775 tons, 27,000 ft 36-in. and 6000 ft 20-in. water supply mains, Anacortes, Wash.; bids about Jan. 1, 1955; Carey & Kramer, Seattle, engineers.

100 tons or more, 100,000-gal water tank; also water treatment plant and 5400 ft 8 and 10-in. steel pipe and fittings bids to Madras, Oreg., Nov. 5.

100 tons or more, outfall structure and flume; also 800 ft 66-in. government furnished pipe for Hanford Works, Hanford, Wash.; general contract by Atomic Energy Commission to Cisco Construction Co., Portland, Oreg., at $119,505.

PIPE . . .

CAST IRON PIPE PLACED

1400 tons, for local system expansion, Spokane, Wash., to Pacific States Cast Iron Pipe Co., Portland, Oreg.

97 tons, local improvements, Seattle, to U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

1000 tons, water system expansion, Fairbanks, Alaska; general contract to Peter Kiewit Sons Co., Longview, Wash., low at $1,353,170 to Alaska Public Works; alternative figures for steel pipe; bids opened Sept. 3.

STEEL PIPE PENDING

150 tons, also 75 tons of cast iron; The Dalles project; bids to U. S. Engineer, Portland, Oreg., Dec. 15.

RAILS, CARS . . .

RAILS PENDING

U. S. Engineer, Portland, Oreg., 3673 tons of 130.5, 110.4 and 133.4 lb rail steel; also nine tons of tie plates and 4125 pairs of joint bars for Union Pacific Railway relocation at The Dalles dam project, Columbia river; bids to Portland, Oreg., Nov. 16; delivery by Feb. 15, 1955.

U. S. Engineer, Portland, Oreg., 193 tons steel rails; sixth phase of The Dalles dam construction; bids to Portland, Dec. 15.

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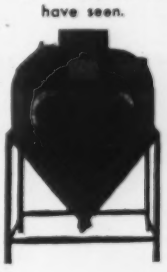
PANGBORN BLASTS by don herold

When those small metal parts call out, "Hey, cleaning time!"
And you have to remove scale, old paint, rust or grime . . .

You can clean them in seconds and save money, too —
Pangborn's Blast Cleaning Cabinets made just for you.

It produces a finish so smooth and so clean,
It will do the best job that you ever have seen.



Pangborn Blast Cleaning Cabinet

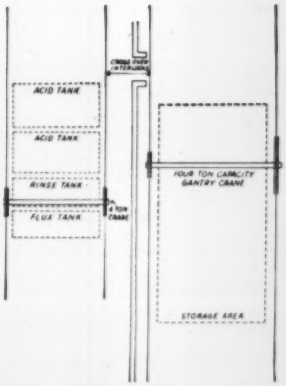
for efficient, low-cost cleaning of metal parts. Cleans pieces up to 35" x 60" in size. Models from $319 and up.

For details, write:
PANGBORN CORP., 1600 Pangborn Blvd., Hagerstown, Maryland

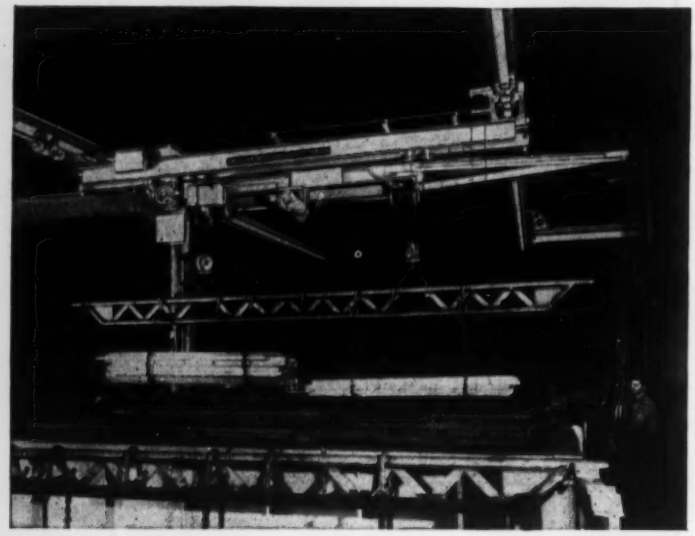
Pangborn

BLAST CLEANS CHEAPER
with the right equipment for every job

50th Anniversary Medallion



AMERICAN MONORAIL GANTRY CRANE SYSTEM *speeds galvanizing!*



Steel fence posts travel from fabrication to galvanizing over a gantry bridge which interlocks at a crossover track through doorway for passage to the MonoRail crane serving the tanks in the plating room.

All travel on the 4-ton system is motor operated and controlled by push-button station in the operator's hand.

Here is truly team-work handling that results in cost savings as well as increased tonnage through the galvanizing process. It is a typical example of American MonoRail engineering available at no obligation for the solution of your handling problems.

Send for Bulletin C-1 illustrating hundreds of successful Mono-Rail installations.

AMERICAN OVERHEAD HANDLING EQUIPMENT

AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE • CLEVELAND 7, OHIO

Aetna-Standard designers and builders of production machinery

Flat Rolled Equipment

AT FAIRLESS WORKS...

● In flat rolled finishing equipment, Aetna-Standard engineered and built the following equipment:

80" Sheet Side Trimming, Slitting and Recoiling.

80" Sheet Side Trimming and Shearing.

56" Wide Side Trimming and Shearing.

Sheet Stretcher Leveller.

For the Tin Mill Division, Aetna furnished a complete Hot Dip Tinning House with all auxiliaries; a side trimming and shearing line; a side trimming and recoiling line; and the classifying equipment for the electrolytic tinning line.

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

SUBSIDIARY and ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.
Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.
M. Castelli, Inc., New York, N. Y. — Mexico, Central and South America.
Société de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.
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Hein & Kuligren, Inc., Akron, Ohio — Representative for the Rubber Industry.
Standard Engineering Company, Ellwood City, Pa.
Trans-World Traders, Pittsburgh, Pa.

Designers and Builders to the Ferrous, Non-Ferrous, Leather, Rubber, and Plastic Industries

New tapered bore TIMKEN® bearing has interference fit—yet can be removed easily

THIS Timken® TQIT bearing gives you maximum capacity for high-speed roll necks. It has an interference fit, yet it can be removed quickly and easily. All you have to do is expand its cones hydraulically.

This Timken roller bearing, like other Timken roll neck bearings, gives you better steel, more uniform gage and less scrap loss. That's because there's no need to change the screw-down pressure when the mill comes to speed.

To get into production, you make the screw setting, put the load on the Timken 4-row tapered roller bearings and start the mill rolling. Adjustment is maintained while mill operates under various loads and speeds.

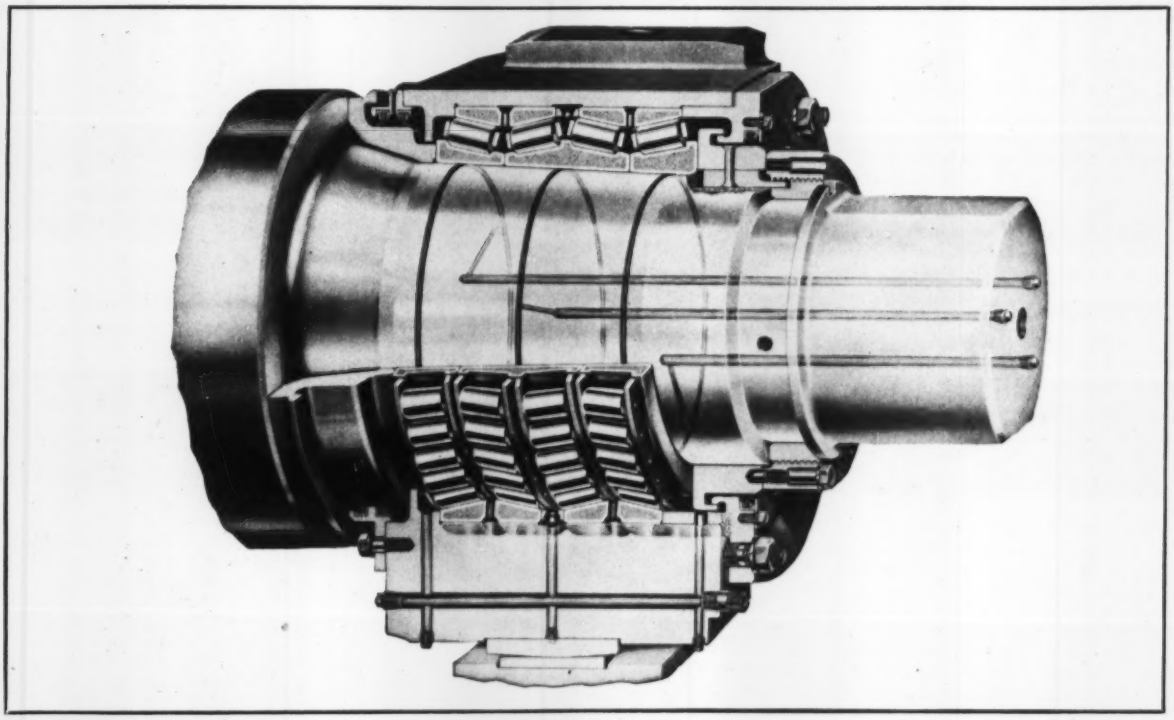
Timken bearings use economical grease lubrication. Complicated lubricating systems are eliminated. There's no loss of lubricant during roll changes. Rolls can be changed faster because there are no pipes or tubes. And there's less leakage of lubricant because Timken bearings keep housings and shafts concentric, making closures more effective.

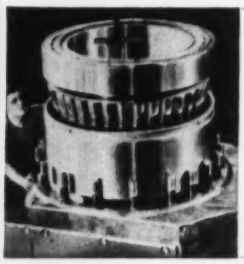
There's no need for special thrust bearings because the tapered construction of Timken bearings enables them to take any combination of radial and thrust loads. And Timken bearings make possible higher mill speeds. Their true rolling motion and incredibly smooth surface finish practically eliminate friction. Starting resistance is reduced to a minimum. Result, no roll scuffing, no scoring of steel.

This is the world's first 4-row tapered bore bearing. And it's the greatest development in roll neck bearing design since the Timken Company pioneered the first balanced proportion bearing in 1941.

Write now for more information on how this new bearing can benefit your mill. Address The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.





ROLL NECK BEARING ENGINEERING SERVICE

Our field and service engineers have had years of experience with problems of roll neck bearing design and operation. They'll help you select bearings and design mountings. The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

TIMKEN

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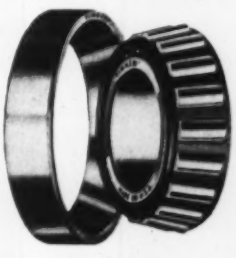
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL AND THRUST → ← LOADS OR ANY COMBINATION